IV&C

Industrial Video and Control

IVC Relay Server Software Setup Guide

RSS-4000 Series

Relay Server Setup Guide

RSSG-v1.1

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All names of people and organizations used in this document's examples are fictitious. Any resemblance to any actual organization or person, living or dead, is purely coincidental and unintended.

Intended Audience for this Document

This document covers IVC Relay Server Software from a surveillance or process monitoring system administrator's perspective. It is solely aimed at system administrators, and administrator rights might be required in order to be able to access the majority of features described in this document. It is assumed the reader has a basic understanding of IP-networking principles.

This document provides detailed descriptions of Relay Server Software administration features. It also provides a large number of targeted "how-to" examples, guiding administrators through completing configuration and administration tasks in Relay Server.

This document contains very limited end-user related documentation. Administrators requiring information about end-user related client applications should refer to the targeted manuals available on the Relay Server Software CD as well as from www.ivcco.com.

Users who do not have surveillance system administrator responsibilities—such as users of the IVC View Station—will find that this manual is not of relevance to them. These users will be able to find information suited to their needs in the separate manuals available on the software CD provided with their purchase as well as from www.ivcco.com.

Support Resources

If during installation, configuration, or use of any of IVC's software or hardware products you need assistance, please do not hesitate to contact IVC Product Support at **617-467-3059** or **support@ivcco.com**. You may also find useful information on the Support page of our website at **www.ivcco.com**.

Additionally, the optional support services listed below are available from IVC to help facilitate the installation and configuration of your system as well as shortening your learning curve with our products. Contact your IVC sales representative for more information and the fees for these services.

- On-site support
- System Preconfiguration
- Training
- Customized Documentation Services
- Factory Acceptance Tests
- Software Support Subscriptions
- Extended Product Warranties

IVC Video System Overview

As figure 1 illustrates below, an IVC Video System consists of a network of one or more IP-enabled cameras and at least one computer running IVC Relay Server Software (RSS). Cameras could include any mix of the following camera types:

- IP cameras purchased from IVC. IVC offers a wide variety of indoor and outdoor cameras. Our Relay Server software supports our fixed, auto zoom, and pan tilt cameras. These products are available with CCD, megapixel, or thermal imagers and come with several connectivity options that include copper, fiber, wireless, and cellular. IVC also offers a broad range of rugged cameras that are certified for use in potentially dangerous environments.

- Legacy analog cameras IP-enabled through the use of IP encoders. IVC offers several encoder options. Contact your local sales representative to determine which of these will best leverage your existing installation.

- Supported third-party cameras. In addition, to our own cameras, IVC Relay Server Software supports a broad array of cameras manufactured by the world's leading camera technology companies.

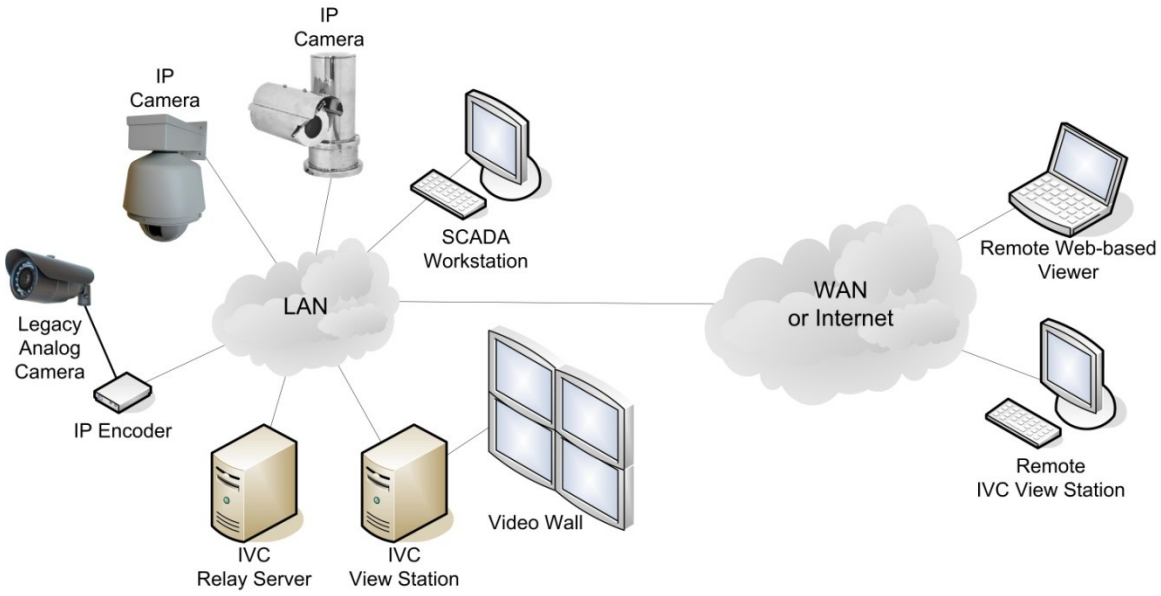


Figure 1

At the heart of your IP video system, the IVC Relay Server performs the following primary functions:

- Direct live video from camera feeds to clients on the network and provide a consistent, cohesive interface for the viewing and control of these cameras. Clients could include one or more of the following:

  - Web page
  - IVC View Station
  - SCADA or other third-party application
- Act as a network video recorder by managing continuous or event-based storage of video from connected cameras.
- Direct playback of stored video or snapshots to attached clients
- Manage bandwidth consumed by video feeds
- Provide mechanism for securing the video network through user authentication.

The Relay Server Software is comprised of three functional components:

Main Control Panel – Primary user interface for viewing live and stored video and controlling cameras. The Main Control Panel is also where administrators access system configuration tools.

System Manager – Primary administrator interface for configuring system operating parameters and individual camera feeds.

View Manager – Primary administrator interface for configuring user camera control tools such as presets and panoramas.

Interfaces for each of these components are HTML pages served by the Relay Server. Therefore, any authorized users or administrators can access these components from anywhere on the network. The following sections of this manual will provide details on the installation of the Relay Server Software and as well as configuration of these features to meet your application requirements.

To install and configure the Relay Server Software you will execute the following basic steps:

Software Installation

Define and Configure Relay Server System Parameters

Define and Configure Camera Feeds

Define and Configure Viewing Controls

The following sections of this manual are organized as shown above and will provide you the details you need to configure the Relay Server Software to meet your application requirements.

The appendices of this manual provide additional information on the use and configuration of the IVC Relay Server Software.

Camera Setup

We recommend you consult the Camera Installation Guides shipped with your cameras for details on configuring feeds in the Relay Server. However, Appendix A includes a table with setup information for some of our most popular camera models.

Troubleshooting

The Frequently Asked Questions (FAQ) and troubleshooting section of this manual is found in Appendix B.

SCADA Integration

IVC's Relay Server Software includes an ActiveX API to facilitate the inclusion of the Relay Server's viewing and controls interfaces into third party applications such as SCADA. Video from IVC's Relay Server has been integrated into industry popular SCADA programs such as:

- Citect
- Emerson DeltaV
- GE Intellution
- Invensys Wondware
- Rockwell RSView, FactoryTalk View

Details on the IVC Relay Server Software ActiveX API are found in Appendix C.

Video Storage

Storing video or snapshots is a crucial part of most surveillance or monitoring systems. The sections below describe the system and camera parameters needed to achieve your storage goals. Appendix D provides some detail on calculating required storage capacity and retrieval of stored video.

System Requirements

The following are minimum requirements for the computers required to run the IVC Relay Server Software:

- CPU: Intel® Xeon®, minimum 2.0 GHz (DuoCore recommended)
- RAM: Minimum 1 GB (2 GB or more recommended)
- Network: Ethernet (1 Gbit recommended)
- Graphics Adapter: AGP minimum 1024×768, 16 bit colors, 256MB RAM
- Hard Disk Type: E-IDE, PATA, SATA, SCSI, SAS (7200 RPM or faster)
- Hard Disk Space: Minimum 100 GB free (depends on system storage requirements. See section ##)
- Operating System: Microsoft® Windows® Server 2008 (32 bit or 64 bit) or Windows Server 2003 (32 bit or 64 bit); Microsoft Windows 2000 Professional, Windows XP Professional, Windows 7
- Software: Microsoft .NET 3.5 Framework Service Pack 1

1 Software Installation

Software Installation

The following paragraphs describe how to install IVC's Relay Server Software on Windows Server, 2000, XP, and Windows 7 platforms.

NOTE: IF YOU PURCHASED A RELAY SERVER COMPUTER FROM IVC, THE RELAY SERVER SOFTWARE IS ALREADY INSTALLED AND LICENSED. YOU CAN SKIP THIS SECTION AND PROCEED TO THE CONFIGURATION SECTION, IF NECESSARY.

Insert the software CD shipped with your camera products. The installation software will automatically display the following HTML page (Fig. 2) in your default browser.

NOTE: IVC RECOMMENDS THE USE OF MICROSOFT INTERNET EXPLORER VERSION 8.0 OR MOZILLA FIREFOX VERSION 3.6.3

Relay Server & View Station - Mozilla Firefox
File Edit View History Bookmarks Tools Help
file:///D:/contents.html
Yahoo! Search
Relay Server & View Station
Welcome to Industrial Video & Control
Software
Install Relay Server
Install ActiveX-Control
Install View Station Server
Install Tour Server
Install Alarm Server
Install Run as a Service
Causes the Relay Server Software to start automatically after power is interrupted
IP Installers
Each Camera Type Requires a Different IP Installer. Click IP Installer for a list, then select the proper IP Installer from below
IP Installer1 | IP Installer2 | IP Installer2.1 | IP Installer3 | IP Installer3.1 | IP Installer3.2
Refer to Documents for further configuration.
IV&C
Industrial Video & Control
Logo Copyright © 2001 Industrial Video & Control Co. All rights reserved.
Software Copyright © 2001-2005 Industrial Video & Control Co. All rights reserved.

Figure 2

1. Click on the Install Relay Server link to install the software on this computer. The following dialog will appear:

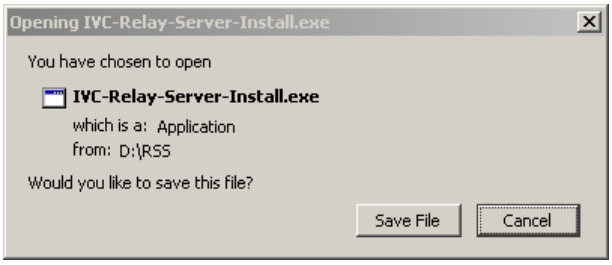


Figure 3

2. Click on **Save File** and observe that your browser displays that file has been downloaded to your computer. This is the installation program for the Relay Server Software.

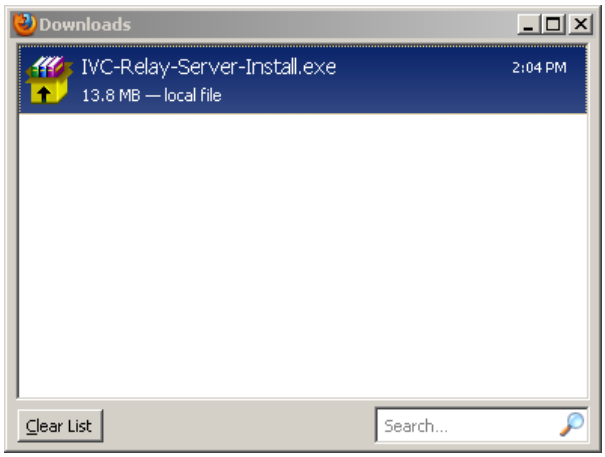


Figure 4

3. To run the installation program, double click the download entry or, as shown below, from entry's right mouse button menu select **Open**.

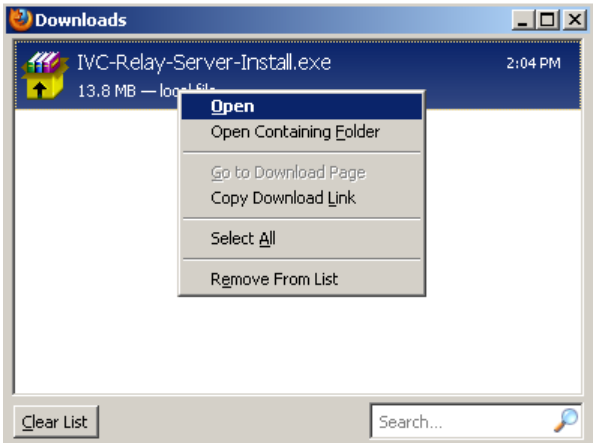


Figure 5

4. The installation program will initially display a dialog box with the IVC Relay Server Software license agreement. You must click **Accept** to proceed.

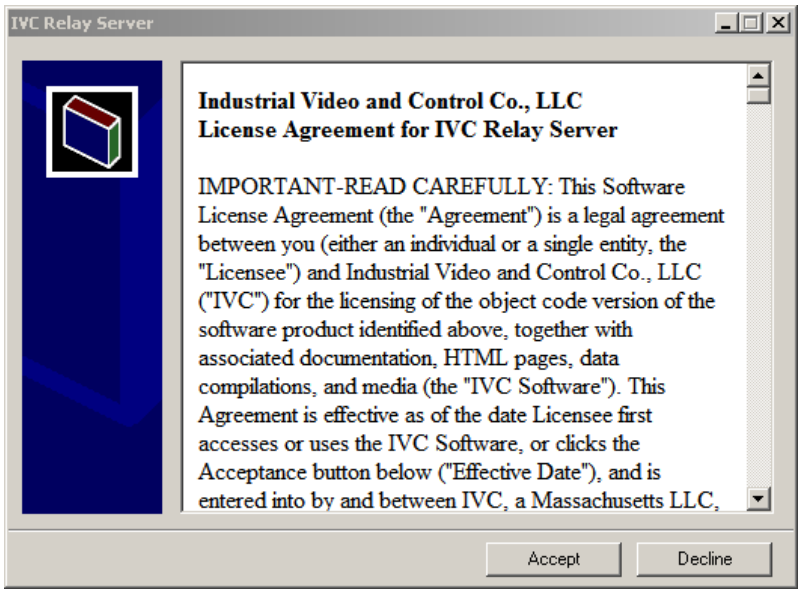

IVC Relay Server
Industrial Video and Control Co., LLC
License Agreement for IVC Relay Server
IMPORTANT-READ CAREFULLY: This Software License Agreement (the "Agreement") is a legal agreement between you (either an individual or a single entity, the "Licensee") and Industrial Video and Control Co., LLC ("IVC") for the licensing of the object code version of the software product identified above, together with associated documentation, HTML pages, data compilations, and media (the "IVC Software"). This Agreement is effective as of the date Licensee first accesses or uses the IVC Software, or clicks the Acceptance button below ("Effective Date"), and is entered into by and between IVC, a Massachusetts LLC,
Accept
Decline

Figure 6

5. The next dialog displayed lets you define the root folder of the Relay Server installation. It is recommended to use the default folder. Click **Install** to install the software in this folder.

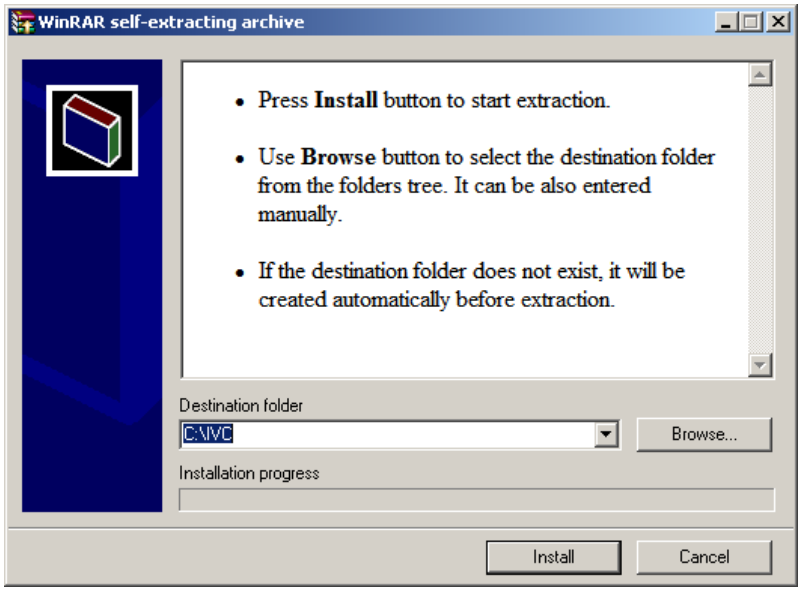

WinRAR self-extracting archive
Press Install button to start extraction.
Use Browse button to select the destination folder from the folders tree. It can be also entered manually.
If the destination folder does not exist, it will be created automatically before extraction.
Destination folder
C:\IVC
Browse...
Installation progress
Install
Cancel

Figure 7

6. Observe the extraction of the software files and advancement of the installation progress bar as shown in Fig. 8. Once the installation is complete the installation program will automatically end. Also observe the temporary appearance of Windows Command Window (Fig. 9).

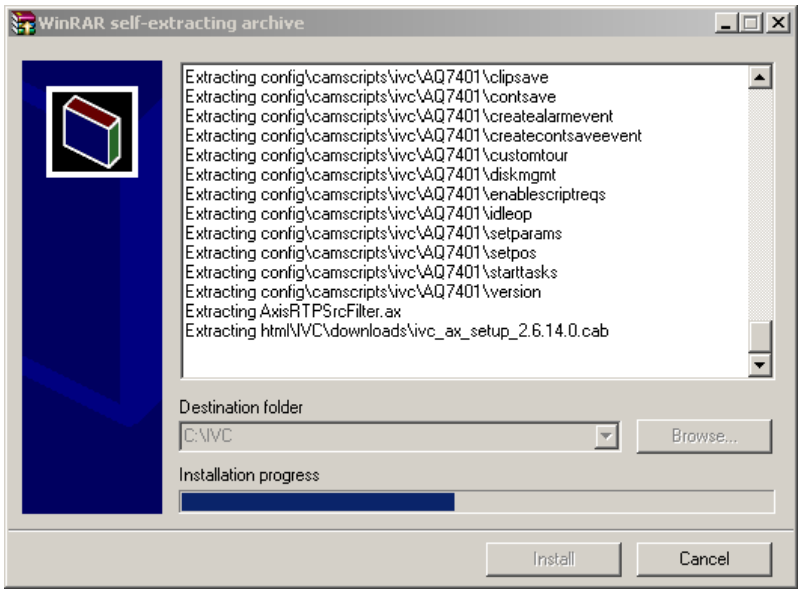


Figure 8

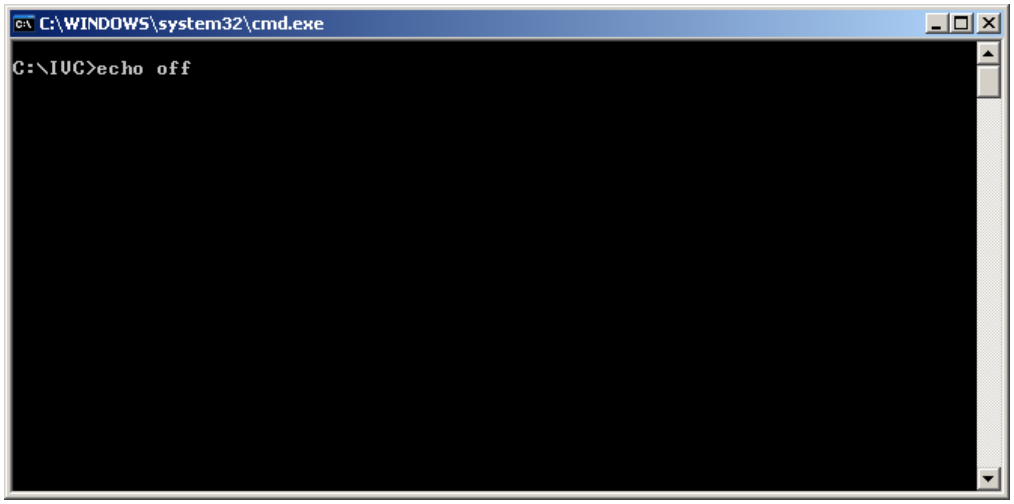
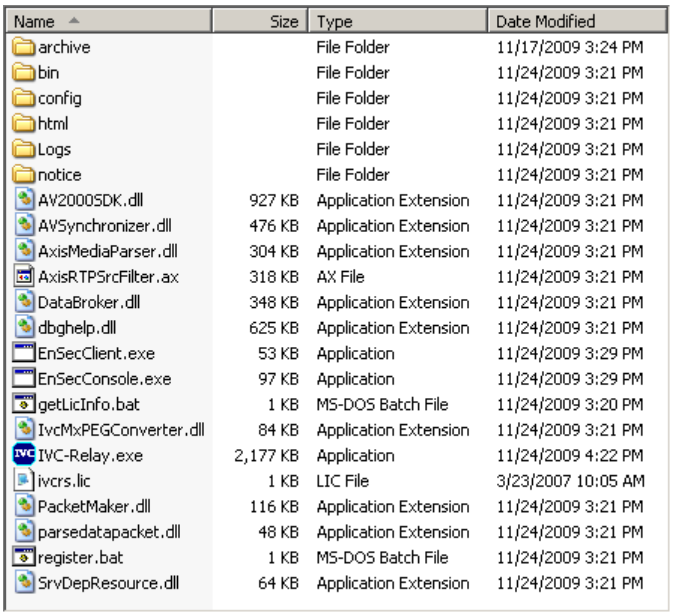


Figure 9

7. At this point, the Relay Server is ready to be configured to operate as required. It is highly recommended that, before you proceed, you install the Relay Server as a service on this computer. This will ensure that the program starts automatically when this computer powers up or restart automatically should there be a temporary power interruption at this computer. Running the Relay Server as a service you better ensure optimum performance of your video system. To install the Relay Server as a server on this computer, click **Install Run as a Service**.

The result of the Relay Server Software installation will be a directory structure as illustrated in Figure 10.



Name	Size	Type	Date Modified
archive		File Folder	11/17/2009 3:24 PM
bin		File Folder	11/24/2009 3:21 PM
config		File Folder	11/24/2009 3:21 PM
html		File Folder	11/24/2009 3:21 PM
Logs		File Folder	11/24/2009 3:21 PM
notice		File Folder	11/24/2009 3:21 PM
AV2000SDK.dll	927 KB	Application Extension	11/24/2009 3:21 PM
AVSynchronizer.dll	476 KB	Application Extension	11/24/2009 3:21 PM
AxisMediaParser.dll	304 KB	Application Extension	11/24/2009 3:21 PM
AxisRTPSrcFilter.ax	318 KB	AX File	11/24/2009 3:21 PM
DataBroker.dll	348 KB	Application Extension	11/24/2009 3:21 PM
dbghelp.dll	625 KB	Application Extension	11/24/2009 3:21 PM
EnSecClient.exe	53 KB	Application	11/24/2009 3:29 PM
EnSecConsole.exe	97 KB	Application	11/24/2009 3:29 PM
getLicInfo.bat	1 KB	MS-DOS Batch File	11/24/2009 3:20 PM
IvcMxPEGConverter.dll	84 KB	Application Extension	11/24/2009 3:21 PM
IVC-Relay.exe	2,177 KB	Application	11/24/2009 4:22 PM
ivcrs.lic	1 KB	LIC File	3/23/2007 10:05 AM
PacketMaker.dll	116 KB	Application Extension	11/24/2009 3:21 PM
parsedatapacket.dll	48 KB	Application Extension	11/24/2009 3:21 PM
register.bat	1 KB	MS-DOS Batch File	11/24/2009 3:21 PM
SrvDepResource.dll	64 KB	Application Extension	11/24/2009 3:21 PM

Figure 10

Files and folders of which to take note are:

- **Archive folder** – Contains destination folders for storage of date- and time-stamped camera video and snapshot files.
- **Config folder** – Contains configuration files created as a result of Relay Server configuration and camera feed definition. You may be asked to review these files by IVC Support should you contact us with a problem.
- **IVC-Relay.exe** – IVC Relay Server executable
- **ivcrs.lic** – IVC Relay Server license file. This file is supplied by IVC after purchase (see below). **DO NOT EDIT THIS FILE**.

Product Licensing

You MUST have a valid license key from IVC before your installed software will operate correctly. To obtain this key (ivcrs.lic), send an email with the following information to support@ivcco.com.

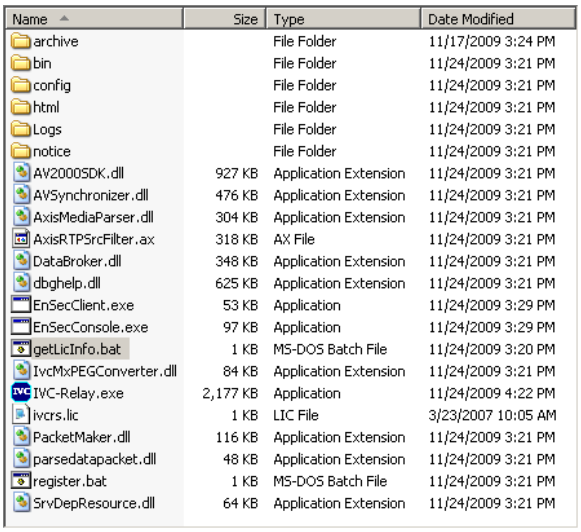
NOTE: DO NOT CONFIGURE THE RELAY SERVER UNTIL YOU HAVE RECEIVED AND INSTALLED THE LICENSE KEY. RELAY SERVER WILL HAVE TO BE UNINSTALLED AND REINSTALLED SHOULD THIS OCCUR.

MAC address of the Relay Server computer's network interface card (NIC). If the computer has more than one NIC, select the MAC address of the NIC to which the camera network is connected. If this information is not readily available, you can determine the MAC by using one of the two methods described below.

Method 1

From the Relay Server root directory double-click the file getLicInfo.bat to execute this batch file.

The result will be the creation of the file IVCLicInfo.txt. This text file will contain the MAC address of the Relay Server computer. Attach this file to an email to **support@ivcco.com** along with your company name and the number of cameras to be connected to this Relay Server.

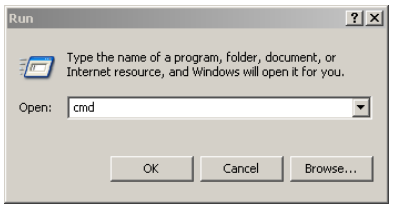


Name	Size	Type	Date Modified
archive		File Folder	11/17/2009 3:24 PM
bin		File Folder	11/24/2009 3:21 PM
config		File Folder	11/24/2009 3:21 PM
html		File Folder	11/24/2009 3:21 PM
Logs		File Folder	11/24/2009 3:21 PM
notice		File Folder	11/24/2009 3:21 PM
AV2000SDK.dll	927 KB	Application Extension	11/24/2009 3:21 PM
AVSynchronizer.dll	476 KB	Application Extension	11/24/2009 3:21 PM
AxisMediaParser.dll	304 KB	Application Extension	11/24/2009 3:21 PM
AxisRTPSrcFilter.ax	318 KB	AX File	11/24/2009 3:21 PM
DataBroker.dll	348 KB	Application Extension	11/24/2009 3:21 PM
dbghelp.dll	625 KB	Application Extension	11/24/2009 3:21 PM
EnSecClient.exe	53 KB	Application	11/24/2009 3:29 PM
EnSecConsole.exe	97 KB	Application	11/24/2009 3:29 PM
getLicInfo.bat	1 KB	MS-DOS Batch File	11/24/2009 3:20 PM
IvcMxPEGConverter.dll	84 KB	Application Extension	11/24/2009 3:21 PM
IVC-Relay.exe	2,177 KB	Application	11/24/2009 4:22 PM
ivcrs.lic	1 KB	LIC File	3/23/2007 10:05 AM
PacketMaker.dll	116 KB	Application Extension	11/24/2009 3:21 PM
parsedatapacket.dll	48 KB	Application Extension	11/24/2009 3:21 PM
register.bat	1 KB	MS-DOS Batch File	11/24/2009 3:21 PM
SrvDepResource.dll	64 KB	Application Extension	11/24/2009 3:21 PM

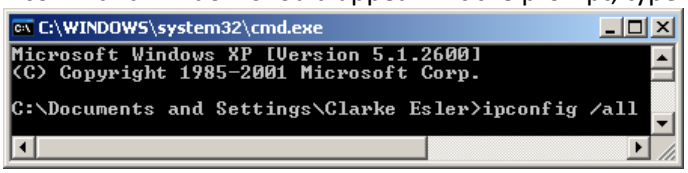
Method 2

From the Windows Start menu select Run.

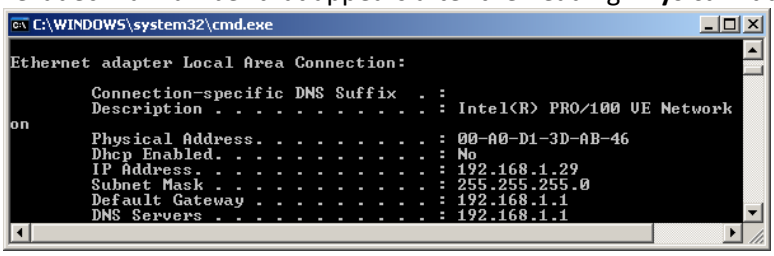
In the resulting dialog type cmd and click OK.



A command window should appear. At the prompt, type ipconfig /all.


C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
C:\Documents and Settings\Clarke Esler>ipconfig /all

Note the information that appears in the command window. The MAC address is the 12-digit hexadecimal number that appears after the heading **Physical Address. . . . . .:**


C:\WINDOWS\system32\cmd.exe
Ethernet adapter Local Area Connection:
Connection-specific DNS Suffix . :
Description . . . . . : Intel(R) PRO/100 VE Network
on
Physical Address. . . . . : 00-A0-D1-3D-AB-46
Dhcp Enabled. . . . . : No
IP Address. . . . . : 192.168.1.29
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.1.1
DNS Servers . . . . . : 192.168.1.1

This is the number that should be included in the email to IVC Support along with:

- Number of cameras to be connected to this particular Relay Server.
- Company name.

IVC Support will immediately respond with the ivcrs.lic file required for you to operate your video system. Copy this file into the root directory defined during installation (default is C:\IVC). You are now ready to configure your IVC video system.

Camera Installation

In order for the Relay Server to manage any camera connections it needs to know the IP address of each camera. IVC strongly suggests that this IP address assignment be part of the pre-installation bench test procedure for each camera. Details on bench testing and IP address assignment can be found in the Camera Installation Guide supplied with each camera.

This page left intentionally blank.

Define and Configure Relay Server System Parameters

Starting Relay Server

In order to configure Relay Server, the software must be running. If you installed the Relay Server as a service, then the program should already be running. You can confirm this by noting the appearance of a command window that will look similar to that shown in Fig. 11 below.

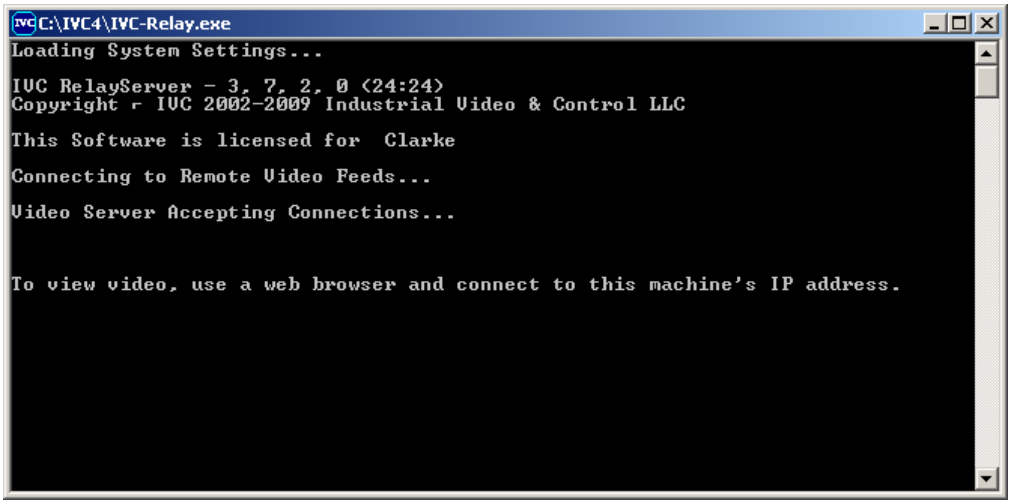

C:\IVC4\IVC-Relay.exe
Loading System Settings...
IVC RelayServer - 3, 7, 2, 0 (24:24)
Copyright r IVC 2002-2009 Industrial Video & Control LLC
This Software is licensed for Clarke
Connecting to Remote Video Feeds...
Video Server Accepting Connections...
To view video, use a web browser and connect to this machine's IP address.

Figure 11

Configuration of the Relay Server takes place through its HTML interface. To access this interface type in the IP address of the Relay Server computer into your web browser. You should see the following page displayed in your browser:

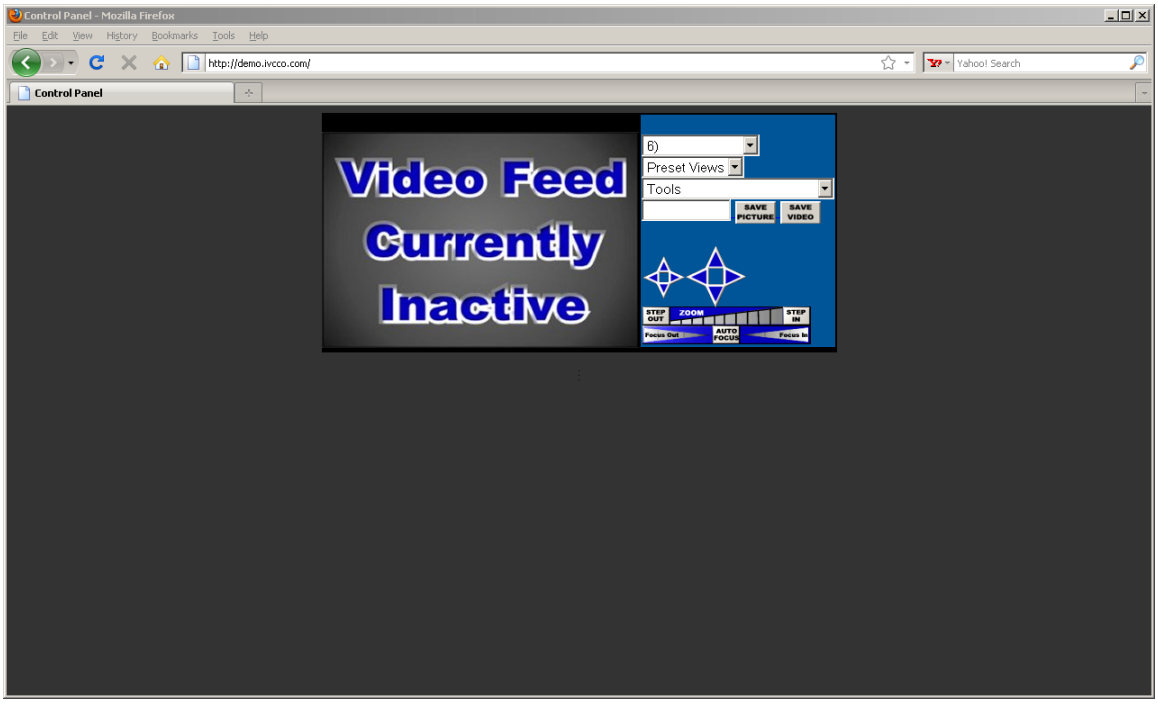


Figure 12

System Configuration

This page (Fig. 12) is called the **Main Control Panel.** To access the configuration pages:

1. Click on the **Tools** drop-down menu
2. Select **View Manager**

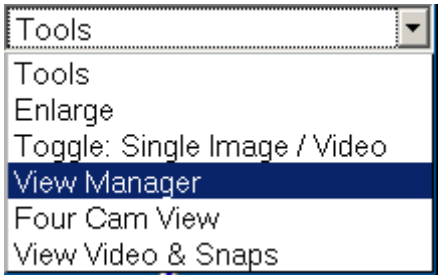


Figure 13

3. The Relay Server will now display the **View Manager** page as shown in Fig. 14.

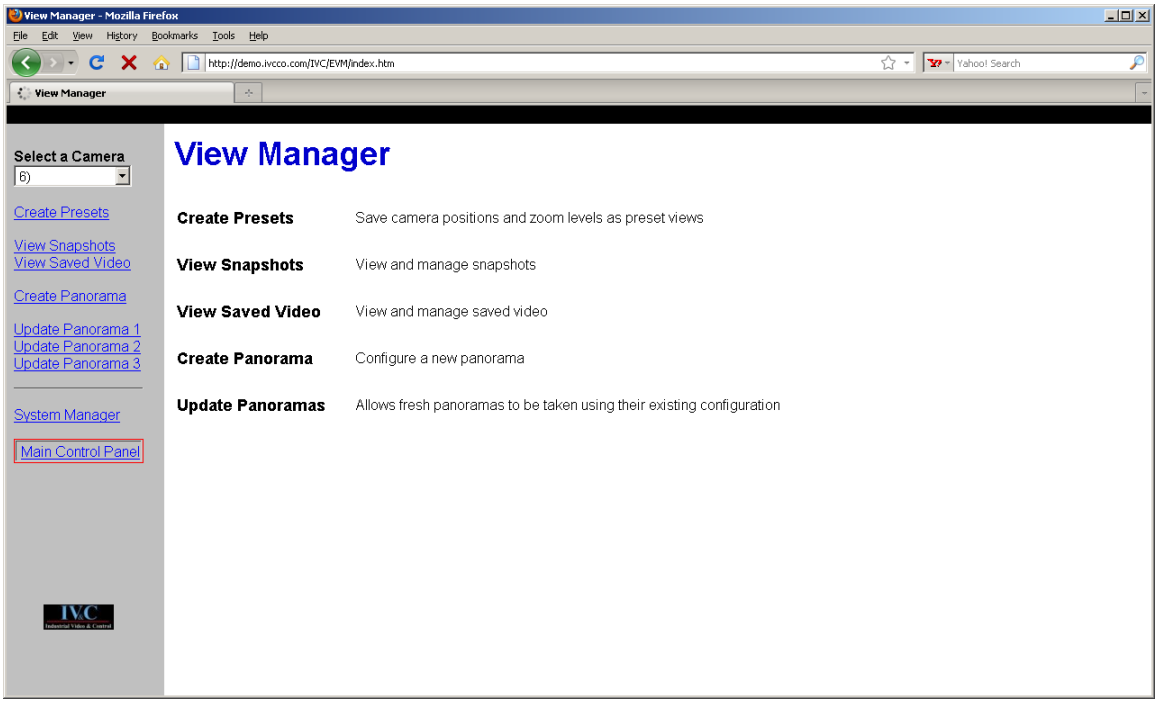

View Manager - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://demo.ivcco.com/IVC/EVM/index.htm
View Manager
Select a Camera
6)
Create Presets
View Snapshots
View Saved Video
Create Panorama
Update Panorama 1
Update Panorama 2
Update Panorama 3
System Manager
Main Control Panel
View Manager
Create Presets Save camera positions and zoom levels as preset views
View Snapshots View and manage snapshots
View Saved Video View and manage saved video
Create Panorama Configure a new panorama
Update Panoramas Allows fresh panoramas to be taken using their existing configuration

Figure 14

4. From the menu on the left, click on **System Manager.**
5. The Relay Server now presents the **System Manager** page (Fig. 15).

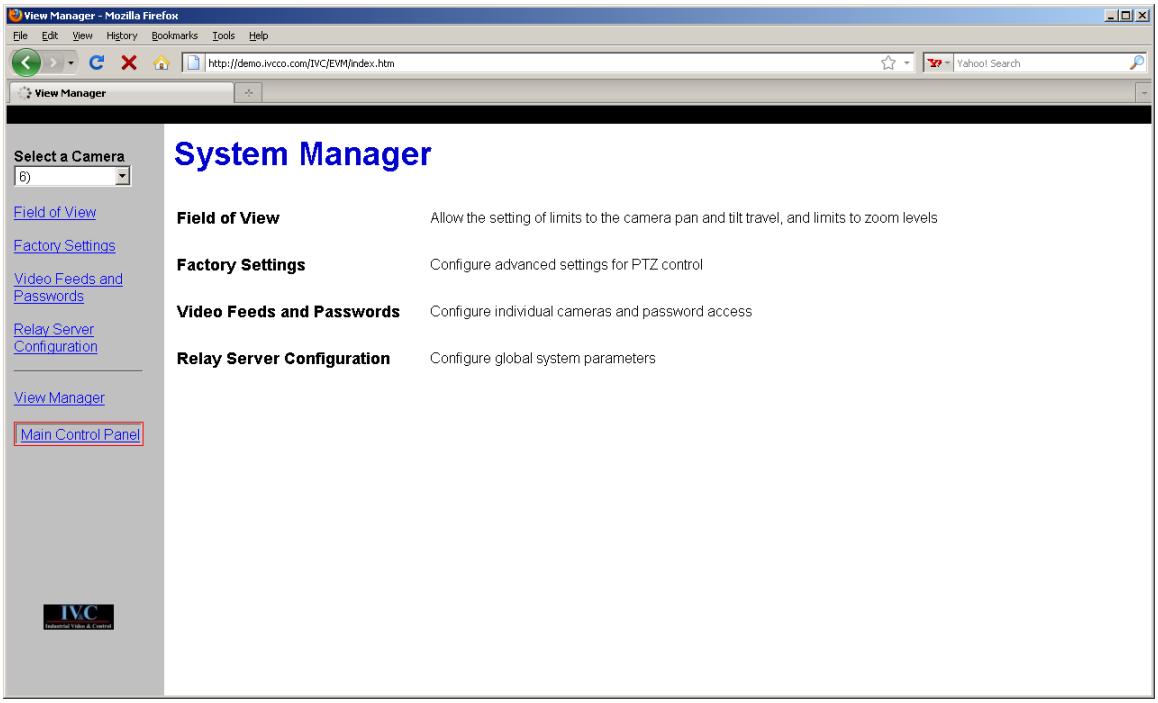

View Manager - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://demo.ivcco.com/IVC/EVM/index.htm
View Manager
Select a Camera
6)
Field of View
Factory Settings
Video Feeds and Passwords
Relay Server Configuration
View Manager
Main Control Panel
System Manager
Field of View
Allow the setting of limits to the camera pan and tilt travel, and limits to zoom levels
Factory Settings
Configure advanced settings for PTZ control
Video Feeds and Passwords
Configure individual cameras and password access
Relay Server Configuration
Configure global system parameters

Figure 15

6. From the menu on the left, click on **Relay Server Configuration.**

7. The Relay Server now presents the **Relay Server Configuration Panel** (Fig. 16).

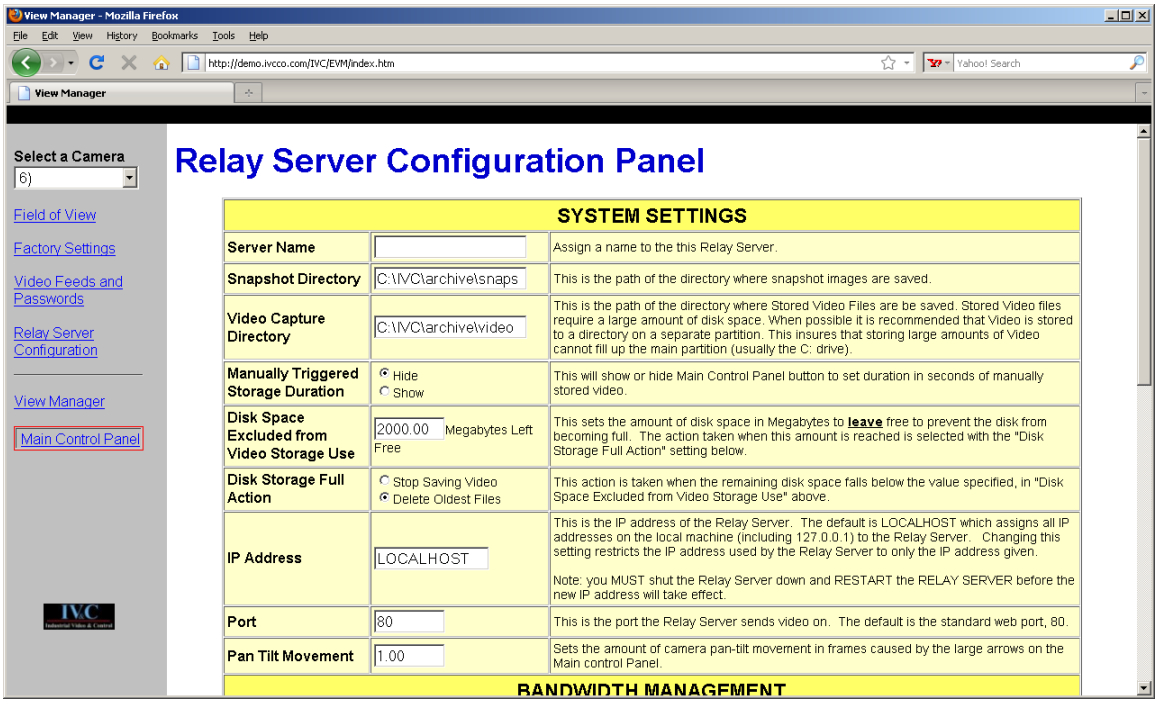

View Manager - Mozilla Firefox
http://demo.ivcco.com/IVC/EVM/index.htm
View Manager
Select a Camera
6)
Field of View
Factory Settings
Video Feeds and Passwords
Relay Server Configuration
View Manager
Main Control Panel
Relay Server Configuration Panel
SYSTEM SETTINGS
Server Name
Assign a name to the this Relay Server.
Snapshot Directory
C:\IVC\archive\snaps
This is the path of the directory where snapshot images are saved.
Video Capture Directory
C:\IVC\archive\video
This is the path of the directory where Stored Video Files are be saved. Stored Video files require a large amount of disk space. When possible it is recommended that Video is stored to a directory on a separate partition. This insures that storing large amounts of Video cannot fill up the main partition (usually the C: drive).
Manually Triggered Storage Duration
Hide
Show
This will show or hide Main Control Panel button to set duration in seconds of manually stored video.
Disk Space Excluded from Video Storage Use
2000.00
Megabytes Left Free
This sets the amount of disk space in Megabytes to leave free to prevent the disk from becoming full. The action taken when this amount is reached is selected with the "Disk Storage Full Action" setting below.
Disk Storage Full Action
Stop Saving Video
Delete Oldest Files
This action is taken when the remaining disk space falls below the value specified, in "Disk Space Excluded from Video Storage Use" above.
IP Address
LOCALHOST
This is the IP address of the Relay Server. The default is LOCALHOST which assigns all IP addresses on the local machine (including 127.0.0.1) to the Relay Server. Changing this setting restricts the IP address used by the Relay Server to only the IP address given.
Note: you MUST shut the Relay Server down and RESTART the RELAY SERVER before the new IP address will take effect.
Port
80
This is the port the Relay Server sends video on. The default is the standard web port, 80.
Pan Tilt Movement
1.00
Sets the amount of camera pan-tilt movement in frames caused by the large arrows on the Main control Panel.
BANDWIDTH MANAGEMENT

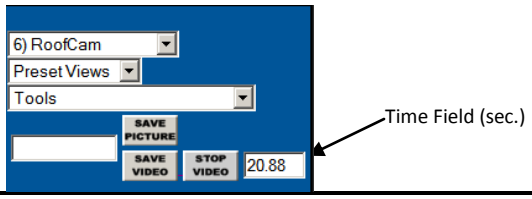
Figure 16

Note that this page is divided into five sections:

- System Settings
- Bandwidth Management
- Alarm Server Settings
- System Security
- Site Information

System Settings

For most applications, the default settings as shown in Fig. 16 will be sufficient to ensure proper system operation. Otherwise, change the settings as your application dictates under the guidelines noted below.

Server Name	Optional field; not required for system operation.
Snapshot Directory	Local drive is default; Any network addressable storage directory is acceptable.
Video Capture Directory	Local drive is default; Any network addressable storage directory with sufficient space is acceptable. **Contact IVC Support if you need assistance in determining system storage requirements.**
Manually Triggered Storage Duration	Adds time field to Main Control Panel to indicate amount of storage taking place. If selected the time field will be displayed in the Main Control Panel as indicated below: 
Disk Space Excluded from Video Storage Use	Useful if your O/S and programs are sharing the same drive as your stored video. If you are storing video to a separate drive, then you can diminish this number to conserve space.
Disk Storage Full Action	Stop recording or continue recording by overwriting oldest files when system detects disk full.
IP Address	As noted, if you enter a number instead of LOCALHOST, then you are limiting access to that single IP address
Port	Change only if there is a conflict with other software.
Pan Tilt Movement	Number entered here determines number of frames the PTZ control on the Main Control Panel will move the selected camera.

Bandwidth Management

Video cameras as network appliances have the potential of consuming lots of network bandwidth. How much a network of video cameras will consume depends on a few variables:

- Number of cameras
- Frame rate (frames per second each camera is outputting)
- Resolution (number of pixels in a frame)
- Compression method utilized by the camera (e.g.: M-JPEG, MPEG4, H.264)

Most camera systems are designed with network topologies that provide more than enough bandwidth to satisfy even the most extreme video requirements. Administrators configuring Relay Server in those situations need not concern themselves with settings in this section. However, in certain situations, it may be useful to control the amount of bandwidth cameras will consume. Examples of where this may be the case include:

- Cameras are sharing a network that includes system critical instrumentation, so it is crucial that the cameras leave enough bandwidth for these devices.
- It is a requirement of the system that video feeds be transmitted over a very low-bandwidth connection, such as a satellite link, that cannot handle streaming video.

The Relay Server provides the facility to control how the video system uses bandwidth on the network through the system settings shown in Fig. 17.

BANDWIDTH MANAGEMENT		
Video Update	○ Single ◉ Continuous	This will control browser clients to receive live video in continuous stream or single image.
Maximum WAN Per Stream Frame Rate	0.00	The maximum allowed frames per second for any stream initiating from the Wide Area Network (WAN). The value can be within the range 0.10 - 0.90. A value of zero will disable this feature.
Maximum LAN Per Stream Frame Rate	0.00	The maximum allowed frames per second for any stream initiated from the Local Area Network (LAN). The value can be within the range 0.10 - 0.90. A value of zero will disable this feature.
LAN IP Ranges		Defines Local Area Network (LAN) IP address ranges that control frame rates to the clients. Examples of ranges include: 130.170.20.1-255, 130.170.5-18. Commas must separate entries, and no spaces are allowed.
Maximum Server Bandwidth	0.00 **Mbps** ◉ Apply to All Requests ○ Apply to WAN Requests	Set a limit on the maximum bandwidth for video output. A value of '0' disables this feature and allows the maximum video output bandwidth.
Maximum Simultaneous Streams to Serve	0 **Streams**	Set a limit on the maximum number of streams that the server can send at once. If the total bandwidth exceeds the value of the "Maximum Server Bandwidth", the "Maximum Server Bandwidth" value will take precedence. A value of '0' disables this feature and allows the maximum number streams to be served.

Figure 17

If you need to limit the amount of bandwidth your video system consumes, set the parameters in this section as indicated under the following guidelines:

Video Update	Bandwidth can be conserved by selecting **Single** image update. Clients only get an image if they request it
Maximum WAN Per Stream Frame Rate	Local drive is default; Any network addressable storage directory is acceptable.
Maximum LAN Per Stream Frame Rate	Local drive is default; Any network addressable storage directory with sufficient space is acceptable. **Contact IVC Support if you need assistance in determining system storage requirements.**
LAN IP Ranges	Specifies IP ranges to which the previous parameter applies.
Maximum Server Bandwidth	Caps total bandwidth consumption for all cameras connected to this server.
Maximum Simultaneous Streams to Serve	Caps the number of simultaneous streams from this Relay Server.

Consult IVC Support if you need help determining your video bandwidth needs.

Alarm Server Settings

The IVC Alarm Server is a component of the IVC View Station Software. As its name implies, it is designed to manage alarms and initiate alarm responses. A unique feature of the Relay Server is its ability to initiate alarm messages based on camera activity. In order for the Relay Server to do this, it must know where the Alarm Server resides. The Alarm Server is a true server program and it can reside on any PC on the network. Enter the specific IP address of this computer. As the Alarm Server is an SMTP server, its default port number is **25**.

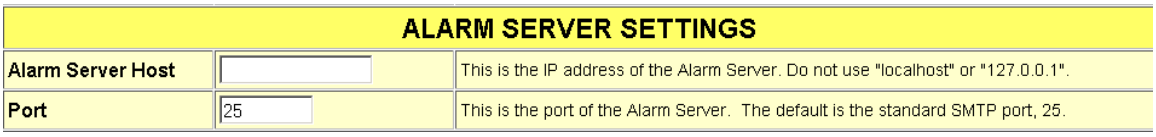

ALARM SERVER SETTINGS
Alarm Server Host
This is the IP address of the Alarm Server. Do not use "localhost" or "127.0.0.1".
Port
25
This is the port of the Alarm Server. The default is the standard SMTP port, 25.

Figure 18

If you have not yet installed the Alarm Server, you can come back to the Relay Server later and enter the appropriate information. If you are not going to use this feature of the Relay Server, you can ignore these settings.

System Security

On a per camera basis, the Relay Server provides the ability to establish three levels of password-protected access. We will present these options in the next chapter. However, to enable this feature, you MUST establish an administrator user name and password on this configuration page.

SYSTEM SECURITY		
System Username and Password		Provides full access to all operational features and system configuration panels. Note: This password MUST be set before any passwords in the "Video Feed Configuration" panel can be set.

Figure 19

Site Information

These setting are not crucial to system operation. See Appendix n for information on these settings.

3 Define and Configure Camera Feeds

Remember that a primary function of the Relay Server is to "relay" camera video feeds to web or fat clients and present a consistent interface regardless of the camera type or manufacturer. In other words, it hides the details of the camera operation from the clients. In order to do this effectively, the administrator must configure the Relay Server with the details each camera feed.

This chapter presents the configuration settings required for each camera feed.

Video Feeds and Passwords

The configuration settings for each camera are entered on the **Video Feeds and Passwords** page. To access this page from the **Relay Server Configuration Panel**, simply click on **Video Feeds and Passwords** in the menu on the left.

To access the Video Feeds and Passwords page from the Main Control Panel:

1. Click on the **Tools** drop-down menu
2. Select **View Manager**

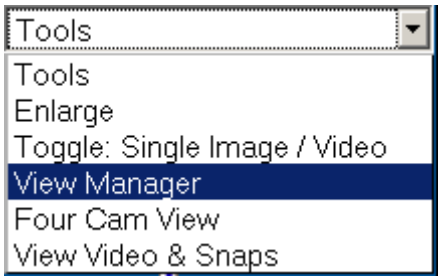


Figure 20

3. The Relay Server will now display the **View Manager** page as shown in Fig. 21.

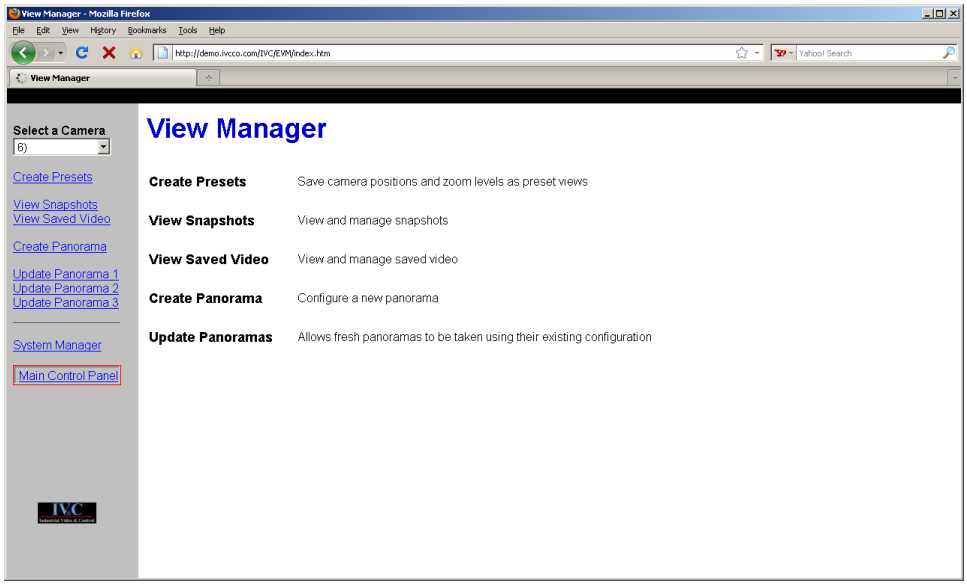


Figure 21

4. From the menu on the left, click on **System Manager.**

5. The Relay Server now presents the **System Manager** page (Fig. 22).

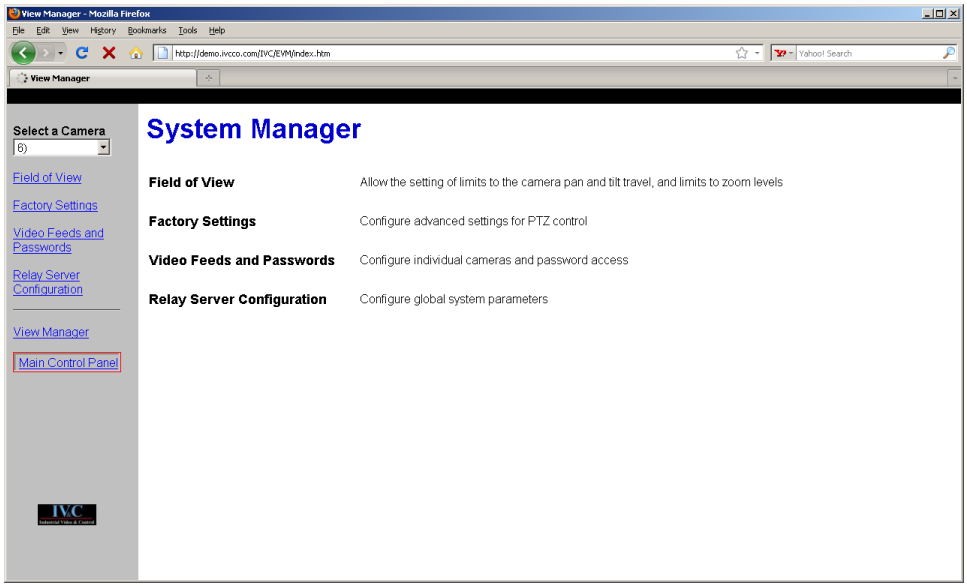

View Manager - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://demo.ivcco.com/IVC/EVM/index.htm
View Manager
Select a Camera
6)
Field of View
Factory Settings
Video Feeds and Passwords
Relay Server Configuration
View Manager
Main Control Panel
System Manager
Field of View
Allow the setting of limits to the camera pan and tilt travel, and limits to zoom levels
Factory Settings
Configure advanced settings for PTZ control
Video Feeds and Passwords
Configure individual cameras and password access
Relay Server Configuration
Configure global system parameters

Figure 22

6. From the menu on the left, click on **Video Feeds and Passwords.**

7. The Relay Server now presents the **Video Feeds and Passwords** page (Fig. 23).

General Feed Properties		
Feed Name	Flame_Cam	Assign a name to the camera. Names may contain alpha numeric characters, dashes and underscores. Spaces are not allowed.
Active Feed	○ Disabled ● Enabled	Feeds can be disabled and re-enabled while preserving their configuration settings.
On Demand Connect	0.0	This mode reduces bandwidth by eliminating the feed when no users are viewing the feed. This value is time in seconds for the feed from camera to time-out when there are no viewers accessing video from this feed. **Caution:** Video will not be stored while the feed has stopped. A value of 0 disables this feature and provides a continuous video feed.
Streaming	○ Streaming OFF ● Streaming ON	Sets Streaming to ON or OFF.
Video Storage Mode	● Manually Triggered Storage ○ Continuous Storage	Manually triggered storage is saved to disk when the "Save Video" button on the is pushed. The video segment size is selected by the "Frame Buffer Size" below. Continuous storage saves all video from this feed to disk in a sequence of files. The file size is selected by the "Continuous Storage File Size" below.
Video Storage Tamper Detection	● Disabled ○ Enabled	When enabled, antitamper seals are added to Stored Video. Stored Video can be scanned later for unauthorized alterations.
Frame Buffer Size	50 frames	This value sets the size of the Manually Triggered video segments. A value of 100 or less is recommended for normal use. If a higher value is desired, make sure that the system has sufficient memory.
Continuous Storage File Size	100 seconds	Continuous stored video is saved to disk in a series of timestamped files. This value sets the duration in seconds of each of those files. Enter a value between 10 - 3600 seconds. seconds.
Max Saved Frames Per Second	0.00	Sets the maximum frames per second at which the Relay Server saves video frames to storage. A value of 0 will capture the maximum frame rate.
Camera Position Latitude and Longitude **Camera Reference** Latitude and Longitude **Camera Elevation**	0.00	Sets the gps latitudinal and longitudinal coordinates of the camera position and a reference object when the camera is centered at it. Camera elevation sets the height of the camera from the ground level assuming that the base of the camera and the target are at the same level. These coordinates are useful when the user wants to aim the camera at any arbitary object using the gps system.
Enable Audio	● Disable Audio ○ Enable Audio	Turns on audio from a supported audio-capable camera server.
Restore PTZ Position Timeout	0 seconds	Sets the amount of video down time in seconds to restore the last PTZ position. A value of 0 disables this feature.

Figure 23

Note that this page is divided into the following six sections:

- General Feed Properties
- Video and Camera Connection Data
- Auxiliary Settings
- Event Notification Settings
- LTC550
- Password Settings
- Other Video Feed Functions

General Feed Properties

This section of the video configuration defines the general operating properties of this feed. It is not necessary to have the actual camera connected to the network to define the feed. Obviously, if this is the case, you will not see video. Without a connected camera, the feed configuration will be saved as inactive. Once the camera is connected to the network, you will have to come back to the Video Feeds and Passwords page and activate the feed.

Set these parameters as indicated by the instructions on the page with the following guidelines:

Feed Name

This is the name that clients will see and use to select the camera, so creating a meaningful name will help make the resulting system more user-friendly.

Active Feed

Select to activate or deactivate the feed. As noted earlier, if the video is defined without the camera connected to the network, this setting will be saved as **Disabled**. Once the camera is connected to the network, you will need to come back to this page and save the setting with **Enabled** option selected.

On Demand Connect

This feature provides a means to conserve bandwidth on a per camera basis. If enabled, the Relay Server will only serve video from this feed if a client requests it. Otherwise, after the specified timeout, the Relay Server will disconnect this feed.

Streaming

This parameter provides another means to control bandwidth consumption on per camera basis. If **Streaming ON** is selected, the camera will “push” video streams onto the network continuously. If **Streaming OFF** is selected, the camera does not stream video. In this case, the Relay Server only “pulls” video streams from the camera when required to do so.

Video Storage Mode

Select to store continuously or on an event. **Manual Triggered Storage** could mean manual storage initiation from a client, or recording based on an alarm or schedule.

NOTE: IF YOU SELECT CONTINUOUS STORAGE, BE SURE THERE IS ENOUGH STORAGE CAPACITY TO SATISFY YOUR STORAGE REQUIREMENTS. CONSULT WITH IVC SUPPORT IF YOU NEED HELP DETERMINING YOUR VIDEO STORAGE NEEDS.

Video Storage Tamper Detection

The Relay Server provides the option to include a digital watermark as part of the stored video from this camera. If included, the IVC video player will check for this watermark and report any frames that are missing or that might have been tampered with. This feature is useful for those applications in which recorded video may be used in a legal proceeding.

NOTE: IF THERE IS A POSSIBILITY THAT RECORDED VIDEO FROM YOUR SYSTEM MAY BE USED IN A LEGAL PROCEEDING, BE SURE TO CHECK WITH YOUR LOCAL AUTHORITIES TO DETERMINE MINIMUM FRAME RATE AND RESOLUTION REQUIRED FOR VIDEO EVIDENCE.

Frame Buffer Size

If you selected the **Manual Storage** option for this camera, this parameter determines the amount of pre-event video, in frames, saved with each segment. The size of the saved pre-event video in terms of time will depend on the frame rate at which the video is saved. For example, if the video is saved at 10 frames per second and the Frame Buffer Size is set to 100, the amount of pre-event video saved will be 10 seconds long.

Therefore, when computing manually triggered segment size from a client, you should take into account the Frame Buffer Size. Using our above example, you will have to store for 20 seconds to get 10 seconds of pre-event video and 10 seconds of post-event video.

Continuous Storage File Size

Needless to say, playing back a 24 hour long video segment to look for an event that occurred in a matter seconds would be quite tedious and frustrating. Relay Server provides this setting to allow you to segment your continuous storage into more manageable segments. Each segment is date and time stamped to make searching for the “right” segment much easier. Keep the user in mind here, and create a segment length that will be most suitable for replay.

Max Saved Frames Per Second

This setting caps the maximum saved video frame rate of this camera. Clients, provided they have the proper rights, can modify this frame rate as required.

Camera Position
Latitude and Longitude
Camera Reference
Latitude and Longitude
Camera Elevation

Using the proper client interface, it is possible to position a pan-tilt-zoom camera using GPS coordinates. In order for such a system to work, the Relay Server needs to know the GPS coordinates of the camera and an arbitrary reference point.

After this camera is installed, you will need to determine the GPS coordinates of the camera location. This can be accomplished using a portable GPS device such as those available from Garmin. Using this device you will also need to determine the coordinates of a reference point.

Enter these coordinates and the elevation of the camera from the ground level where indicated.

Enable Audio

For some camera models, IVC Relay Server supports both live and stored synchronized audio and video. Check with IVC support before enabling this function.

Restore PTZ Position Timeout

In situations where the network connectivity to a pan-tilt-zoom camera might be unreliable (some wireless connections, for instance), it may be useful to restore the last known position of the camera if the connection is lost for some period of time.

This setting determines the amount of time (in seconds) after the connection is lost before trying to restore the PTZ camera to its last known position.

Video and Camera Connection Data

The next set of parameters to define for this camera (shown in Fig. 24) has to do with how the camera communicates to the network.

Video and Camera Connection Data		
Video Server	Type V-1 (1/4 camera) / Cam 1 / Default	Refer to the Camera Setup Table in the "Relay Server Guide" for this selection.
Custom Software	◉ Do not use Custom Software ○ Use Custom Software	Enables the use of optional IVC Custom Software extensions.
Video Feed Host	192.168.1.223	The IP address of the camera or video server feed.
Video Feed Port	8083	The port number that the camera or camera server feed is configured to use. (Usually port 80)
Video Control Host	192.168.1.223	The IP address of the camera or video server control.
Video Control Port	8083	The port number that the camera or camera server control is configured to use. (Usually port 80)
Redirect Client to Camera	◉ Do not Redirect Client ○ Redirect Client	Tells the client to get video directly from the camera server, instead of channeling the video through the Relay Server. **Note: This will only work if anonymous users can access the video from the camera server.**
Synchronize Date & Time	Daily	Synchronize Date & Time of the camera to the RelayServer.
Show Date & Time	○ Do not Show Date & Time ◉ Show Date & Time	Select "Show Date & Time" to put the date and time at the top of the video image.
Video Image Size	352 x 240	Select the size of the video image.
Max Frames Per Second	10.00	Sets the maximum frames per second at which the Relay Server captures video frames from the camera source. A value of 0 will capture the maximum frame rate.
Camera Server Timeouts Connect and Read	30 20	Sets the connect and read timeouts to fine tune network traffic pattern. See the Camera Setup Table in the "Camera & Relay Server Configuration Guide" for information on properly configuring these settings.
MAC Address		The Ethernet MAC address of the camera or camera server.
Camera Server Username and Password	root ivctemp	Sets the username and password used to restrict direct access to the camera. See the Camera Setup Table in the "Relay Server Guide" for information on properly configuring these settings.

Figure 24

Video Server

Every camera that will be connected to this video network has an **IP encoder**. This encoder may be a separate device (as in the case of IP-enabling legacy analog cameras) or integrated with the camera. In order for the Relay Server to communicate with this camera, it must know what type of IP encoder (Video Server) it uses. You can find this information for the camera being configured in the **Camera Installation Guide** shipped with the camera.

Custom Software

Leave as default unless directed otherwise by IVC Support.

Video Feed Host/ Video Feed Port

Enter the IP address and port number of this camera where indicated.

Video Control Host/Video Control Port

In rare cases for some PTZ cameras, the pan-tilt unit will have a different IP address than the IP encoder. If your camera is configured in this way, enter the unique control IP address and port number where indicated. Otherwise, enter the Video Feed Host IP address and port number in these fields. Consult your Camera Installation Guide for more information.

Redirect Client to Camera

Some applications, such as those monitoring critical processes, require near real-time video. Redirecting the client directly to the camera removes any latency that might be introduced by the Relay Server.

Synchronize Date & Time

Most cameras maintain time and provide the option to display date and time information as part of the video image. To maintain consistency throughout the system, it is recommended that you enable the Relay Server to synchronize the time of the server and the configured cameras. This setting determines how often this synchronization will take place.

Show Date & Time

Specify whether you want date and time information to be display in client video windows.

Video Image Size

Specify the live video image size sent to clients. As the drop-down menu indicates you have 2 choices:

1. 1 CIF (352x240 pixels)
2. 4 CIF (704x480 pixels)

Keep in mind that the higher resolution will increase the bandwidth demands of this camera. As with frame rate, it is possible to conserve bandwidth, by providing a "standard" view at the lower resolution and only increase live and/or stored resolution on an event.

NOTE: FOR MEGAPIXEL CAMERAS, THE 4 CIF SETTING WILL PRESENT THE MAXIMUM IMAGE SIZE SUPPORTED BY THE CAMERA. THE 1 CIF SETTING MAY PRODUCE AN IMAGE THAT IS SOME FRACTION OF THE MAXIMUM SIZE. CONSULT THE CAMERA INSTALLATION GUIDE FOR MORE INFORMATION.

Max Frames Per Second

Here is another way to conserve network bandwidth. This setting caps the maximum live video frame rate of this camera. In most surveillance applications, cameras are viewing no activity most of the time, so there is no need to waste bandwidth to view nothing. Using client software like the IVC View Station, you can increase the frame rate based on an event to ensure you store the video quality you need.

Camera Server Timeouts

In order to reduce network traffic, the Relay Server provides **Connect** and **Read** timeouts. Specify the number of seconds after which you want the Relay Server to stop trying to communicate with this camera to perform these operations. Consult the Camera Installation Guide for more information.

MAC Address

If required, enter the MAC address of the camera here. Most current cameras do not require this entry. Consult the Camera Installation Guide for more information.

Camera Server Username and Password

To prevent unauthorized direct access of the networked cameras, it is recommended that the IP server of the camera employ a username and password. IVC cameras and encoders are shipped with default usernames and passwords. If you have already configured the camera and changed the default username and password, enter that information here. Otherwise, consult the Camera Installation Guide to determine the default settings.

Auxiliary Settings

The IVC Relay Server provides the option to add up to four user-defined buttons to the Main Control Panel for the camera being configured. As shown in Fig. 25, to define a custom button, simply:

1. Provide the text to be display on the button (Display String)
2. Provide the Command String that is to be sent to the camera, encoder, or other device. Consult the documentation of the target device for proper command syntax.
3. Specify if the command is intended for the device defined by the IP address of this configured camera (Direct) or if it is to be passed through to a connected secondary device.

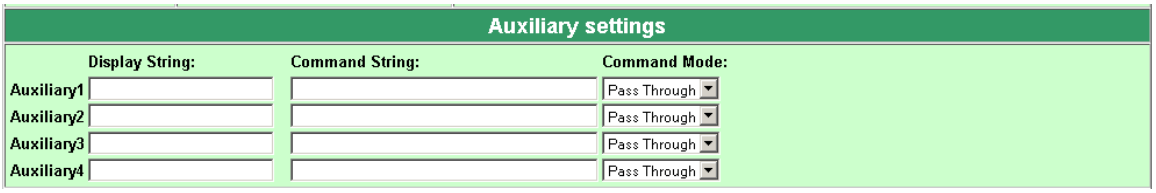


Figure 25

Some examples of how these buttons may be used.

- You are connecting a legacy analog PTZ camera using an encoder provided by IVC. The camera's technology cannot take advantage of the absolute positioning capabilities of the Relay Server. To make camera movement easier for the users you can program buttons to start and stop panning or tilting. In this case the Command Mode would be Direct.
- Most cameras and encoders can control at least one relay output. You can use these buttons to control these outputs and therefore the devices connected to them, such as a gate. The "Open Gate" button Command Mode would be Pass Through.

Event Notifications

The Relay Server is capable of sending alarm messages to the IVC Alarm Server should any of the following conditions occur for this camera:

- PTZ camera movement
- Loss or resumption of video feed

This feature is useful for providing administrators or users immediate status of a camera or notification of a possible unauthorized camera movement.

NOTE: FOR THIS FEATURE TO WORK, YOU MUST ENTER THE IP ADDRESS OF THE ALARM SERVER ON THE RELAY SERVER CONFIGURATION PAGE UNDER ALARM SERVER SETTINGS. THIS PRESUPPOSES THAT THE IVC ALARM SERVER WILL BE INSTALLED AT SOME POINT.

To cause the Relay Server to send an alarm for the conditions described below, simply click on the **Enabled** radio button.

Pre-Event

If enabled, the Relay Server will send an alarm message to the specified Alarm Server just prior to a pan or tilt movement of this camera.

In-Event

If enabled, the Relay Server will send an alarm message to the specified Alarm Server during a pan or tilt movement of this camera.

Post-Event

If enabled, the Relay Server will send an alarm message to the specified Alarm Server just after a pan or tilt movement of this camera.

Video Up

If enabled, the Relay Server will send an alarm message to the specified Alarm Server when the video feed becomes active.

Video Down

If enabled, the Relay Server will send an alarm message to the specified Alarm Server when the video feed is lost.

Pan-Tilt Event Notification Settings		
Pre-Event	◉ Disabled ○ Enabled	When enabled, a notification will be sent before the pan-tilt movement.
In-Event	◉ Disabled ○ Enabled	When enabled, a notification will be sent during the pan-tilt movement.
Post-Event	◉ Disabled ○ Enabled	When enabled, a notification will be sent after the pan-tilt movement is done.
Video Up/Down Event Notification Settings		
Video Up	◉ Disabled ○ Enabled	When enabled, a notification will be sent when the video is up.
Video Down	○ Disabled ◉ Enabled	When enabled, a notification will be sent when the video is down.

Figure 26

LTC550

IGNORE THIS SECTION.

Password Settings

The settings in this section provide the capability to define up to three kinds of users on a per camera basis:

1. Users that can view video, control PTZ or auto-zoom cameras, use any controls on the Main Control Panel for this camera, and use any of the tools in the View Manager (Create Presets, Panoramas, etc.). These users will not have any access to the setup pages in the System Manager.

2. Users that have full access to all controls on the Main Control Panel only. These users will not have access to View Manager or System Manager setup pages.

3. Users that will have view only access. These users will not have access to any controls on the Main Control Panel or setup pages in the View Manager or System Manager.

As the text in Fig. 27 indicates, the usernames and passwords will not be active unless the administrator username and password on the System Manager Configuration page has been set.

Password Settings		
In order for the following to work correctly, the "System User and Password" MUST be set up in the "Relay Server" configuration Panel".		
View Manager Username and Password		Provides the ability to create preset views, create and up-date panoramas, view snapshots and view video.
Main Control Panel Username and Password		Provides full access to all features on the Main Control Panel. Note: This password will not be operative unless you create a View Manager Password.
Video Only Username and Password		Provides View only. No controls are available. Note: This password will not be operative unless you create a Main Control Panel Password and a View Manager Password.

Figure 27

Note these user rights are based on a hierarchy. The View Manager username/password must be set before defining the Main Control Panel username/password; The View Manager and the

Main Control Panel usernames/passwords must be set before defining the Video Only username/password.

Saving the Settings

At this point, you are finished with defining the primary settings for this feed. Click on the **Save Video Configuration** button to save these settings. If the camera is properly connected to the network, you should get indication of a successful save and camera reprogram as shown if Fig. 28.

Figure 28

To further confirm a successful video feed definition, click on the **Main Control Panel** link in the left-hand menu. As shown in Fig. 29, the Main Control Panel should now be displayed with video in the live video window.

Figure 29

Additional Settings for PTZ Cameras

If the camera you are configuring is a pan-tilt-zoom (PTZ) camera, there are a few more settings that need to be configured before the interface for this camera is fully functional. First, go back to the **System Manager** by choosing **View Manager** from the Main Control Panel **Tools** menu.

Next, click on the **Factory Settings** link. As shown in Fig. 30 you will see links to:

- Camera Settings
- Pan Tilt Settings

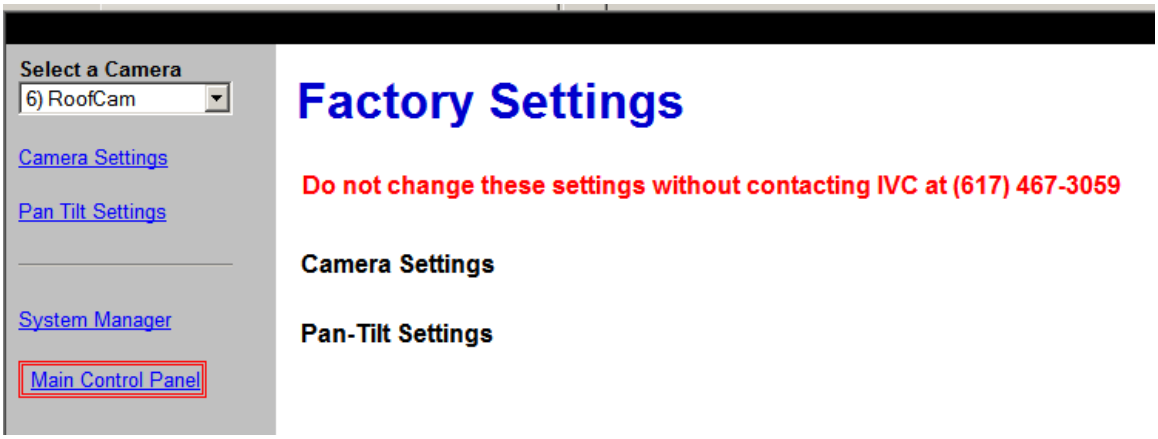


Figure 30

At this point, you will need to consult the Camera Installation Guide shipped with this camera. There will be instructions there to guide you through the proper configuration of these settings for your camera.

NOTE: THE PAN TILT SETTINGS MUST BE PROPERLY SET BEFORE ANY RELAY SERVER CLIENTS CAN PROPERLY CONTROL THIS CAMERA.

Optional Settings for PTZ Cameras

Most PTZ cameras supported by the IVC Relay Server Software provide 360° pan movement and up to 180° tilt movement. However, in some applications, you may wish to limit the full field of view for these cameras for security or privacy reasons. This section describes how to limit the field of view of a PTZ camera.

To set the field of view settings for a PTZ camera, go to the **System Manager** page, make sure the proper camera is selected at the top of the left menu, and click on **Field of View**. The Field of View page, as shown in Fig. 31, will appear.

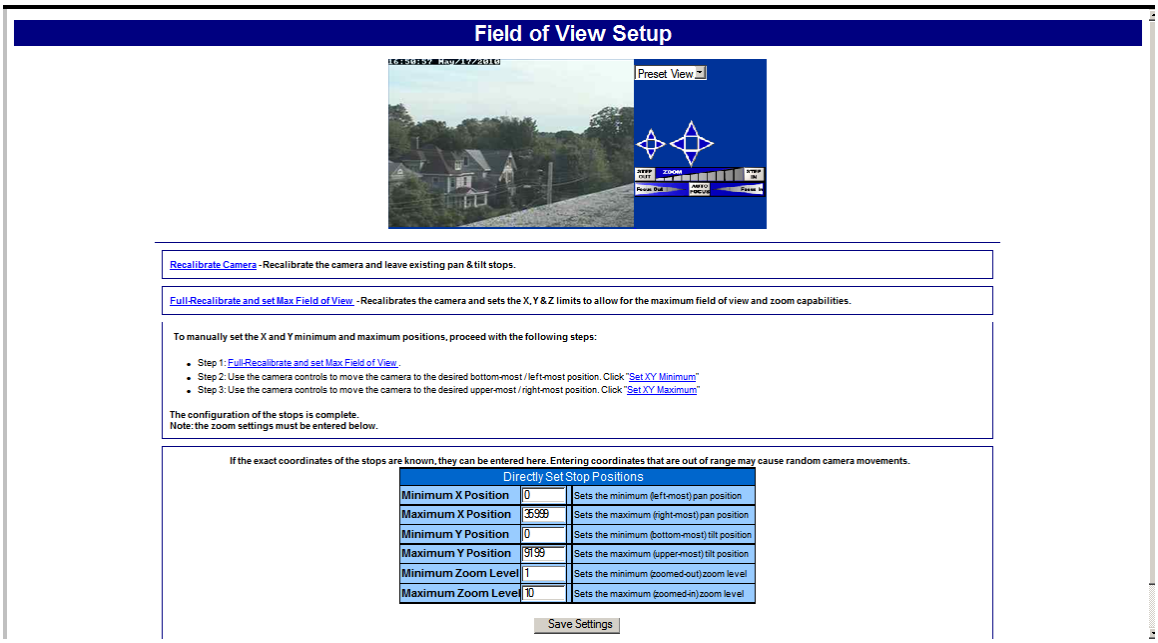

Field of View Setup
Preset View
Recalibrate Camera -Recalibrate the camera and leave existing pan & tilt stops.
Full-Recalibrate and set Max Field of View -Recalibrates the camera and sets the X, Y & Z limits to allow for the maximum field of view and zoom capabilities.
To manually set the X and Y minimum and maximum positions, proceed with the following steps:
Step 1: Full-Recalibrate and set Max Field of View.
Step 2: Use the camera controls to move the camera to the desired bottom-most / left-most position. Click "Set XY Minimum"
Step 3: Use the camera controls to move the camera to the desired upper-most / right-most position. Click "Set XY Maximum"
The configuration of the stops is complete.
Note: the zoom settings must be entered below.
If the exact coordinates of the stops are known, they can be entered here. Entering coordinates that are out of range may cause random camera movements.
Directly Set Stop Positions
Minimum X Position 0 Sets the minimum (left-most) pan position
Maximum X Position 35999 Sets the maximum (right-most) pan position
Minimum Y Position 0 Sets the minimum (bottom-most) tilt position
Maximum Y Position 9199 Sets the maximum (upper-most) tilt position
Minimum Zoom Level 1 Sets the minimum (zoomed-out) zoom level
Maximum Zoom Level 10 Sets the maximum (zoomed-in) zoom level
Save Settings

Figure 31

Camera Recalibration

As shown in Fig. 31, you have two choices for camera recalibration:

1. Partial recalibration that retains the current existing pan and tilt stop settings.
2. Full recalibration that removes existing pan and tilt stops.

After a recalibration, the camera will end up at its default home position.

Defining PTZ stops

Fig. 31 also shows that there are two choices for defining the PTZ stops for the selected camera.

1. Use the live video window and the accompanying controls to position exactly where you want each stop (bottom/left, upper/right) and click the appropriate link to set the limit.
2. If you know the exact coordinates in degrees with two digits of precision, you can type in these numbers (NO DECIMAL POINTS) and minimum and maximum zoom levels. Once these parameters are entered, click the **Save Settings** button. The settings shown above are the result of a full calibrate for this camera. Note that the camera is placed in its home position after a full recalibrate and X and Y coordinates are relative to this position.

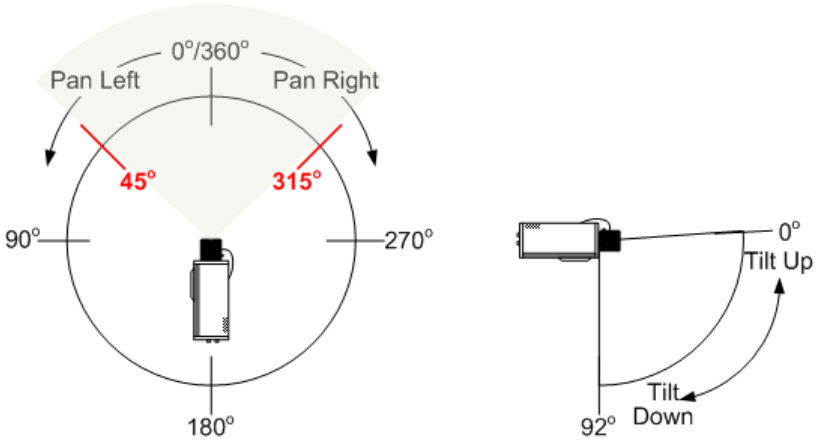


Figure 32

To illustrate, Fig. 32 depicts the pan and tilt ranges of one of IVC's standard outdoor dome PTZ cameras. If you wanted to define the pan stops indicated in this drawing by the red numbers and shaded area (with full tilt and zoom range), the necessary values would be:

Minimum X Position:	4500
Maximum X Position:	31500
Minimum Y Position:	0
Maximum Y Position:	9199
Minimum Zoom Level:	1
Maximum Zoom Level:	10

As Fig. 32 illustrates, the Pan Left limit will always be a value greater than or equal to zero and the Pan Right limit will always be a value less than or equal to 35999. Tilt Up limit values for this camera will always be a value greater than or equal to zero and the Tilt Down limit will always be less than or equal to the maximum down limit of the camera. Note that some supported PTZ cameras offer 180 degrees of tilt. For these cameras the tilt range values would be from -9000 to 9000.

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Define and Configure Viewing Controls

IVC has designed the interface to control PTZ cameras to be “click to point” for all both thin (web) and fat clients (View Station, SCADA. The Main Control Panel (Fig. 33) is the primary user interface page served by the Relay Server Software to web clients. There are several ways for users to control the pan, tilt, and zoom operations of PTZ cameras:

1. **Click in live image** – Clicking in the live image will cause the PTZ camera to center on the click point provided the camera is not already at a pan or tilt limit.
2. **Discreet controls** – As indicated in Fig. 33, the Main Control Panel provides discreet pan and tilt controls and zoom controls. These are described below:

   Click on the large arrow button to move the camera the distance programmed (default is 1 frame) on the System Manager/Relay Server Configuration page.

   Click on the small arrow button to move the camera the half of the value programmed for the large button.

   Click on the zoom bar to control the zoom level.

   Click on the focus bar to control camera focus.
3. **Preset Views** - Click on this drop down menu to select programmed, named preset camera positions.
4. **Panorama** – Click on programmed, static panoramic image to move camera to precise location.

Figure 33

5. Presets and Panoramas are defined in the View Manager. This rest of this chapter presents details on how to define and modify Presets and Panoramas.

NOTE: CAMERAS FOR WHICH PRESETS AND PANORAMAS ARE TO BE CREATED MUST BE PROPERLY CONFIGURED IN THE RELAY SERVER, CONNECTED TO THE NETWORK, AND OPERATIONAL.

Creating Presets

A preset is a named coordinate that users can use to quickly move a PTZ camera to a predefined position and zoom level. To create a preset select **View Manager** from **Tools** menu (Fig. 34).

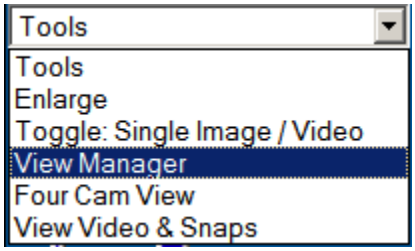


Figure 34

The Relay Server will display the View Manager (Fig. 35).

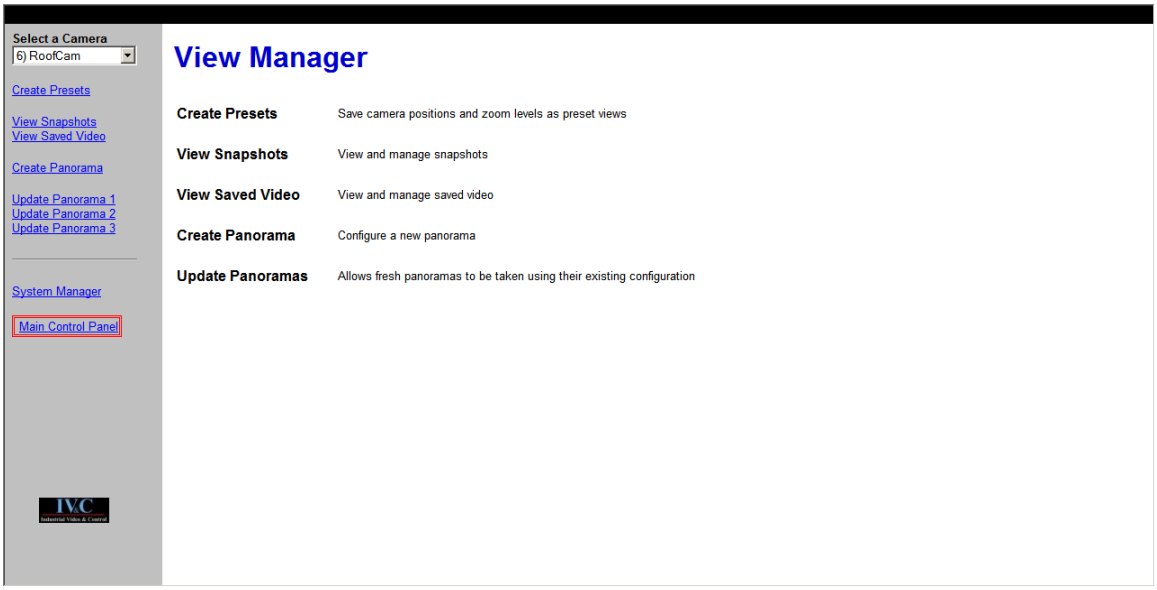


Figure 35

Make sure the proper PTZ camera is selected the drop-down menu on the top of the View Manager menu. From the View Manager menu, click on Create Presets. The Relay Server will display the Preset Setup page as shown in Fig. 36.

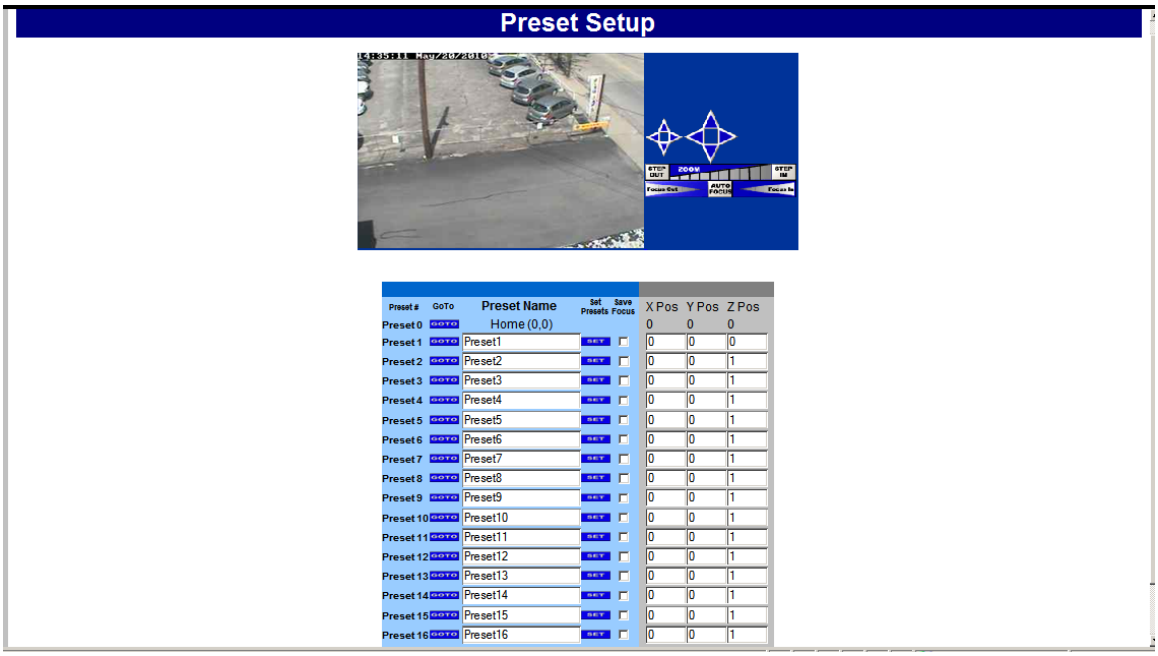

Preset Setup
Preset # GoTo Preset Name Set Presets Save Focus X Pos Y Pos Z Pos
Preset 0 GOTO Home (0,0) 0 0 0
Preset 1 GOTO Preset1 SET 0 0 0
Preset 2 GOTO Preset2 SET 0 0 1
Preset 3 GOTO Preset3 SET 0 0 1
Preset 4 GOTO Preset4 SET 0 0 1
Preset 5 GOTO Preset5 SET 0 0 1
Preset 6 GOTO Preset6 SET 0 0 1
Preset 7 GOTO Preset7 SET 0 0 1
Preset 8 GOTO Preset8 SET 0 0 1
Preset 9 GOTO Preset9 SET 0 0 1
Preset 10 GOTO Preset10 SET 0 0 1
Preset 11 GOTO Preset11 SET 0 0 1
Preset 12 GOTO Preset12 SET 0 0 1
Preset 13 GOTO Preset13 SET 0 0 1
Preset 14 GOTO Preset14 SET 0 0 1
Preset 15 GOTO Preset15 SET 0 0 1
Preset 16 GOTO Preset16 SET 0 0 1

Figure 36

To define a preset:

1. Using the live video image and its associated controls, position the camera to the location and zoom level you desire for the preset.
2. Type in a meaningful name for the preset (Keep your operators in mind.) You can always come back to this page and change the name if necessary.
3. If necessary, click the **Save Focus** checkbox. Typically, video cameras will auto focus on the nearest object. In some applications, an object of interest may be behind something yet still be visible. Examples are a chain link fence or grate. For instance, you may have a meter behind a chain link fence and desire to define a preset for this location. Using the controls provided, set the position, zoom, and focus level so you can clearly read the meter. Define the preset as described above and then check the **Save Focus** box. This ensures that, regardless of the cameras prior position, zoom level, or focus level, the preset will provide the image you desire.
4. Click the SET button to save this preset. Observe that X, Y, and Z values appear in the fields to the right (See Fig. 37). The positioning values are expressed in degrees with two digits of precision. In our example below the X position is 138.38 degrees and the Y position is 13.58 degrees. The zoom is expressed as a relative level with a whole number between 1 and 10 inclusively, where 1 indicates the camera is zoomed all the way out and 10 indicates the camera is zoomed all the way in. These fields are not editable.
5. Confirm the operation of the preset by moving the camera to some arbitrary position and then click the GOTO button corresponding to the newly defined preset. Observe that the camera moves to the desired position and the intended image is presented. If required, reposition the camera and click the GOTO button to reset the preset.

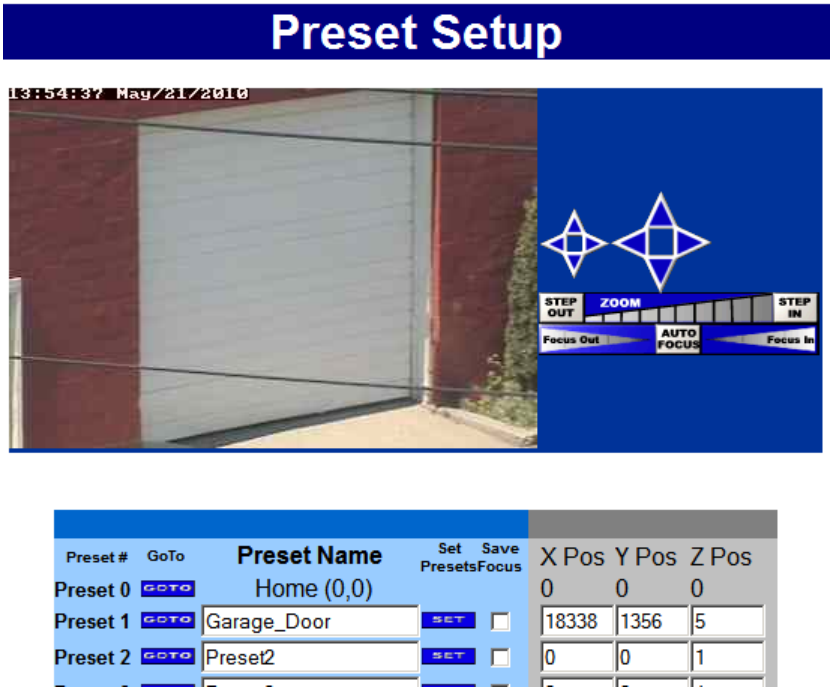


Figure 37

Creating Panoramas

For PTZ cameras that support absolute positioning, the IVC Relay Server can create a static panoramic image of the full field of view of the camera and overlay a coordinate grid providing a precise single click positioning mechanism for users. To illustrate, if a user clicked on the house in the panorama shown in Fig. 38, the camera will move so that live video image will center on the click point.

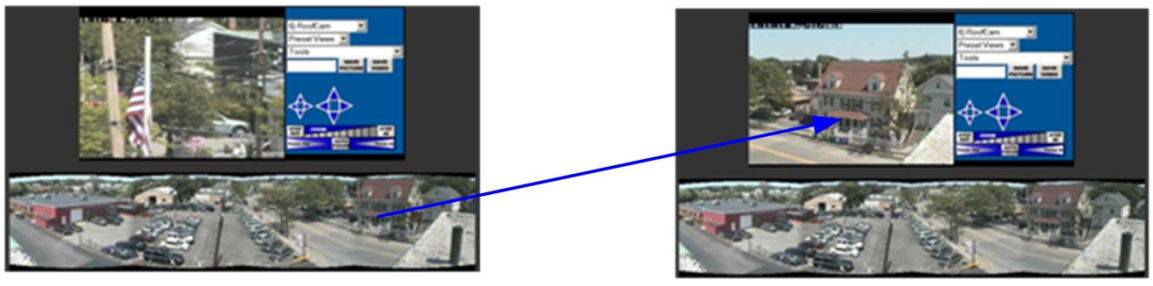


Figure 38

Assuming the panorama is created under ideal weather and lighting conditions, it can be a valuable tool for users to accurately move the camera particularly when lighting and weather are not so ideal. The following paragraphs describe how to create panoramas.

From the menu on the View Manager page, select the appropriate camera and click **Create Panorama** (Fig. 39).

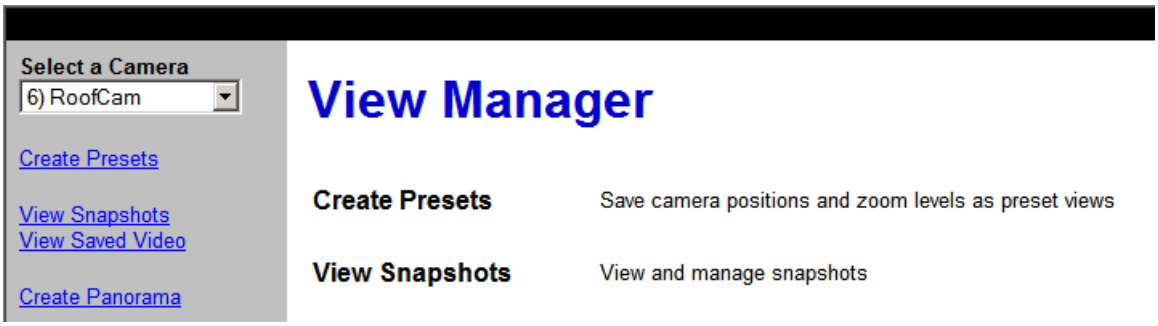


Figure 39

The **Panorama Setup** page (Fig. 40) will appear.

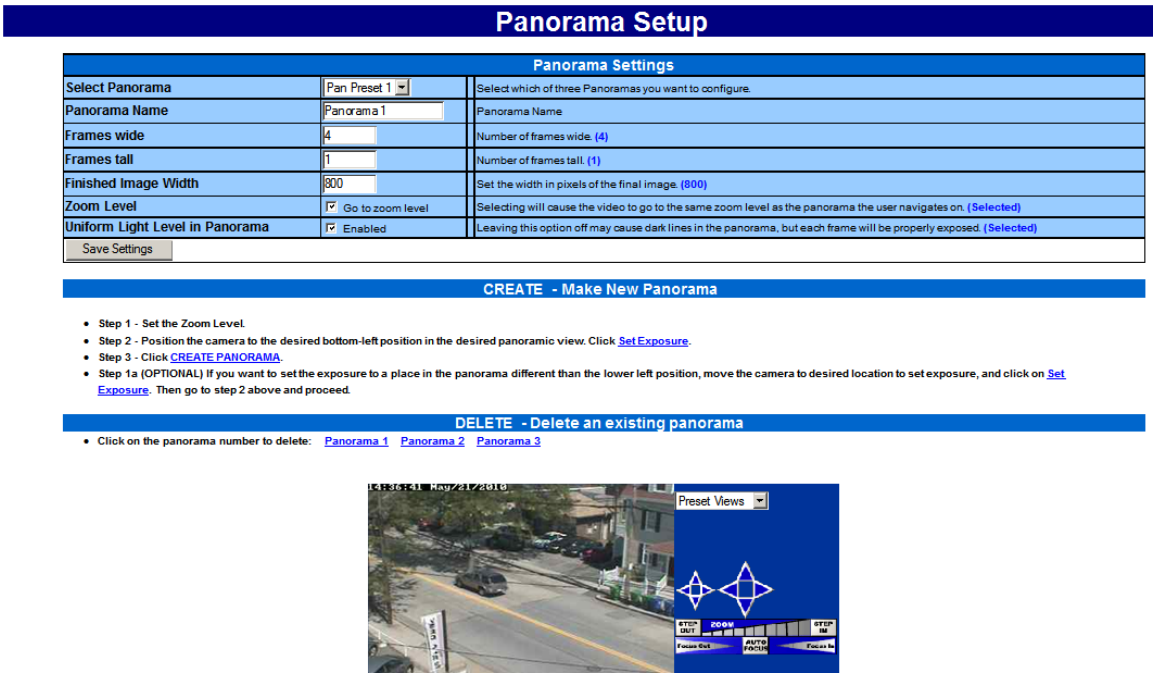

Panorama Setup
Panorama Settings
Select Panorama
Pan Preset 1
Select which of three Panoramas you want to configure.
Panorama Name
Panorama 1
Panorama Name
Frames wide
4
Number of frames wide. (4)
Frames tall
1
Number of frames tall. (1)
Finished Image Width
800
Set the width in pixels of the final image. (800)
Zoom Level
Go to zoom level
Selecting will cause the video to go to the same zoom level as the panorama the user navigates on. (Selected)
Uniform Light Level in Panorama
Enabled
Leaving this option off may cause dark lines in the panorama, but each frame will be properly exposed. (Selected)
Save Settings
CREATE - Make New Panorama
Step 1 - Set the Zoom Level.
Step 2 - Position the camera to the desired bottom-left position in the desired panoramic view. Click Set Exposure.
Step 3 - Click CREATE PANORAMA.
Step 1a (OPTIONAL) If you want to set the exposure to a place in the panorama different than the lower left position, move the camera to desired location to set exposure, and click on Set Exposure. Then go to step 2 above and proceed.
DELETE - Delete an existing panorama
Click on the panorama number to delete: Panorama 1 Panorama 2 Panorama 3
Preset Views

Figure 40

The first thing to do is define the parameters that will govern the appearance of the panorama. These parameters are found in the **Panorama Settings** section of this page. Define the panorama as follows:

Select Panorama	The Relay Server allows the creation of three panoramas per camera. Using the dropdown menu, select which panorama you are defining.
Panorama Name	Here you have the option of assigning a meaningful name to the panorama. This name is used by other clients.
Frames wide	Specify the width, in frames, of the panorama
Frames tall	Specify the height, in frames, of the panorama
Finished image width	Sets the width, in pixels, of the final image. Here you need to take into account the resolution of the display on which the panorama will reside.
Zoom level	If this box is checked, the camera repositioning that results from a user operation in the panorama will include adjusting the zoom to the level of the panorama. If this box is left unchecked, the zoom level will not change.
Uniform Light Level in Panorama	This setting controls the camera's iris. If you are creating the panorama where the lighting conditions are fairly uniform across the width of the panorama's view, check this box. This will keep the camera's iris at its current setting for each snapshot of that makes up the panorama. If you uncheck this box, the camera's iris will adjust as necessary while the camera moves to take snapshots for the panorama. This is recommended if the camera might suddenly look at very bright light or very low light. However, we recommend that, if possible, you check this box and create the panorama when lighting conditions are most uniform. For outdoor panoramas this would be when the sun is highest or on a bright, cloudy day.

Once the above settings are defined click on the

button. If you redefine these parameters, do not forget to click this button. Now you are ready to create the panorama.

Follow the step outlined in the **CREATE – Make New Panorama** section.

1. Using the live image and controls on the bottom of this page, position the camera where you want the lower left image of the panorama to be and set the desired zoom level.
2. If you need to adjust the camera's iris manually, click **Set Exposure** as many times as necessary to achieve the desired image.
3. When satisfied with this starting point, click the **CREATE PANORAMA** link. Observe in the live video window at the bottom of this page, that the camera moves to take each snapshot required for the panorama.

As shown in Fig. 41, the newly created panorama will appear below the live video and controls window.

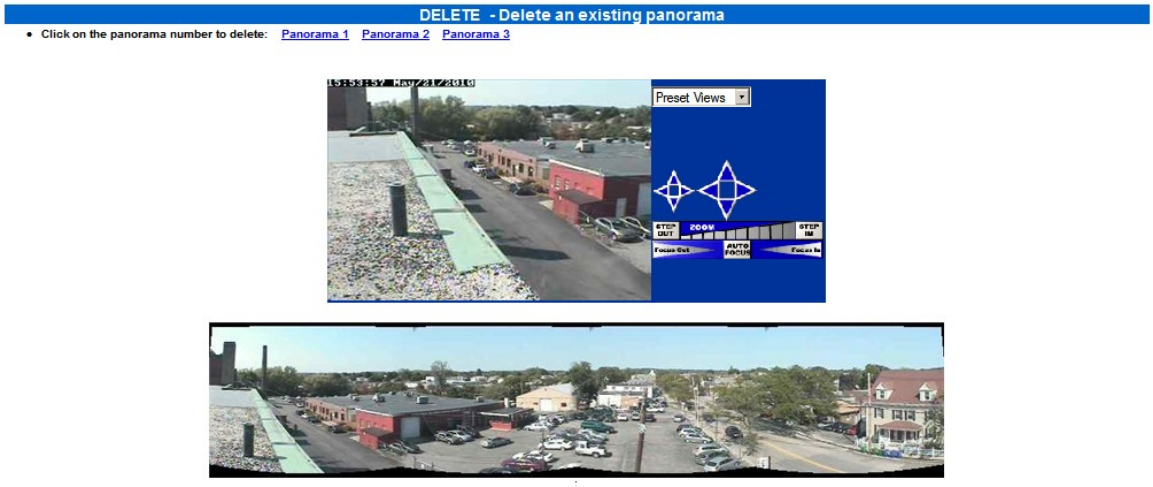

DELETE - Delete an existing panorama
Click on the panorama number to delete: Panorama 1 Panorama 2 Panorama 3
Preset Views
ZOOM
AUTO FOCUS

Figure 41

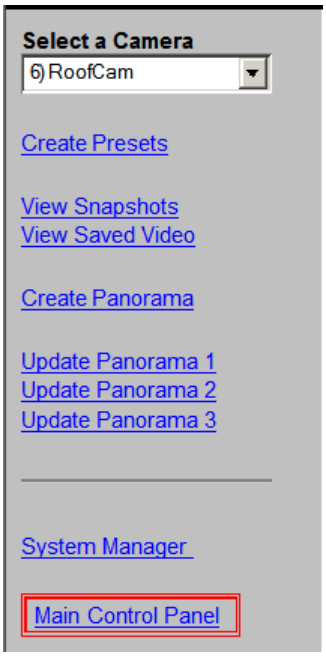
You may click in the panorama to confirm proper operation. If not satisfied with this panorama, simply click the appropriate delete link and repeat the above steps to recreate the panorama.

Once you have finished creating the panorama(s) for this camera, click on the **Main Control Panel** link to return to the Main Control Panel. Note the panorama(s) now appear on the Main Control Panel.

Figure 42

At some point, it may become necessary to update the panoramas you created. This may be due to the addition of new structures or change of seasons. Whatever the reason, the IVC Relay

Server makes this update easy to accomplish. To update a panorama select View **Manager** from the Main Control Panel **Tools** menu.



Select the camera whose panorama(s) you wish to update. Click on the appropriate **Update Panorama** link(s). The Relay Server will display dialog and progress bar indicating the update process. Once the update is complete, go back to the Main Control Panel and check the results. If not satisfactory, you can delete and recreate the panorama as described above.

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Camera Setup Guide

Camera Setup Guide

The table below lists some of IVC's standard camera models along with the following information:

Installer - The IVC provided software program to use to change the IP address of the camera.

Video Server - The Video Server setting to select in the System Manager/Video Feeds and Passwords definition if this camera is being configured into your network.

Pan/Tilt Model - The Pan/Tilt number to select in the System Manager/Factory Settings/Pan Tilt settings for this camera.

Camera Model - The Camera number to select in the System Manager/Factory Settings/Pan Tilt settings for this camera.

User Name - The default User Name shipped with this camera. You must access the camera directly to change this setting. This is the name you must enter as the Camera Server User Name in the SystemManager/Video Feeds and Passwords page for this camera.

Password - The default Password shipped with this camera. You must access the camera directly to change this setting. This is the password you must enter as the Camera Server Password in the System Manager/Video Feeds and Passwords page for this camera.

We strongly urge you to check the User Guide shipped with your camera for the most up-to-date and detailed installation and configuration information.

Model	Installer	Video Server	Pan/Tilt Model	Camera Model	User Name	Password
AMZ-3641-02	Arecont	AV-1	N/A	N/A	N/A	N/A
APTZ-3141-01	2.1	A-1	22	6	root	MAC*
APTZ-3141-02	2.1	A-1	22	17	root	MAC*
APTZ-3141-04	2.1	A-1	22	16	root	MAC*
APTZ-3142-01	3.1	V-1	22	6	root	MAC*
APTZ-3142-04	3.1	V-1	22	16	root	MAC*
APTZ-3142-05	3.1	V-1	22	13	root	MAC*
APTZ-3142-06	3.1	V-1	22	6	root	MAC*
APTZ-3142-08	3.1	V-1	22	16	root	MAC*
APTZ-3142-09	3.1	V-1	22	16	root	MAC*
APTZ-3142-10	3.1	A-1	22	13	root	MAC*
CS-3101	3.1	V-1	N/A	N/A	root	NO PASSWORD

Model	Installer	Video Server	Pan/Tilt Model	Camera Model	User Name	Password
CS-330x	2.1	A-1	N/A	N/A	root	pass
FV-3330-01	3.2	V-1	N/A	N/A	root	NO PASSWORD
MZ-3130-01	3.1	V-1	N/A	N/A	root	NO PASSWORD
MZ-3130-LL	3.1	V-1	N/A	N/A	root	NO PASSWORD
MZ-3132-01	IW2	V-1	N/A	N/A	root	NO PASSWORD
MZ-3300-04	IW2	V-1	N/A	N/A	root	NO PASSWORD
MZ-3330-06	IW2	V-1	N/A	N/A	root	NO PASSWORD
MZ-3333-01	3.2	V-1	N/A	N/A	root	NO PASSWORD
PTZ-3130-02	3.1	V-1	22	16	root	NO PASSWORD
PTZ-3130-03	3.1	V-1	22	6	root	NO PASSWORD
PTZ-3130-04	3.1	V-1	22	6	root	NO PASSWORD
PTZ-3130-06	3.1	V-1	22	6	root	NO PASSWORD
PTZ-3130-07	3.1	V-1	22	6	root	NO PASSWORD
PTZ-3130-08	3.1	V-1	22	17	root	NO PASSWORD
PTZ-3130-10	3.1	V-1	22	17	root	NO PASSWORD
PTZ-3130-11	3.1	V-1	22	6	root	NO PASSWORD
PTZ-3130-12	3.1	V-1	22	6	root	NO PASSWORD
PTZ-3130-LL	3.1	V-1	22	6	root	NO PASSWORD
PTZ-3130-S	1	S-1	6	4	admin	Admin
PTZ-3300-01	3.2	V-1	16	12	root	NO PASSWORD
PTZ-3310-01	3.2	V-1	16	12	root	NO PASSWORD
PTZ-3330-01	2.1	A-1	22	6	root	Pass
PTZ-3330-04	2.1	A-1	22	17	root	NO PASSWORD
ZO-31xx	3.1	V-1	3	1	root	MAC*

** Example (0800467AD0FE) Use all caps and no spaces or hyphens*

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B

FAQ/Troubleshooting Guide

IV&C
Industrial Video and Control

Questions and Troubleshooting

PROBLEM: Live video window on Main Control Panel says Video Temporarily Down?

Figure B-1

Video Temporarily Down indicates loss of power to the Camera or loss of network connection to the Camera.

SOLUTION: Confirm there is power to the Camera and then verify the network connection to the Camera by pinging it. To ping the camera click the Windows Start Menu, Run, enter CMD, type ping_xxx.xxx.x.xx where xxx.xxx.x.xx is the IP address for the camera server. The IP address can be found in View Manager, System Manager, Video Feeds and Passwords, Video Feed Host. If the ping "times out", there is a network problem or the IP address in the camera or Relay Server is not set correctly.

PROBLEM: Live video window on Main Control Panel says Video Feed Currently Inactive?

Figure B-2

This message indicates that the feed has been disabled for some reason and the **Active Feed** setting for this camera on its Video Feeds and Passwords page is **Disabled** as indicated in Fig. B-3. This may occur if the Video Feed is configured incorrectly or if there is a "camera license problem." It will also appear if the camera feed has been configured when the camera is not connected to the network.

Figure 43

SOLUTION: Start by clicking View Manager, System Manager, Video Feeds and Passwords, and checking Enabled under Active Feed. Then click Save Video Configuration at the bottom of the page and wait for the Data Updated message.

PROBLEM: Port Already In Use Error Message displayed
The Relay Server occupies Port 80 by default. If you are running something else on port 80, such as an IIS server or a web server, that will likely also occupy port 80.
SOLUTION: Shut the other applications on that Port to off or change the Port on the Relay Server as follows:

1. From the Main Control Panel, Tools, View Manager, System Manager, Relay Server Configuration, Port, and *enter* a new port.
2. On the Relay Server PC go to C:\IVC\Config and open the "feeddata.txt file" and change the port on the line below. It will be 10th or 11th line

   S|0|S_PORT|80|

3. Change the Cameras to the same Port using the appropriate IP Installer as described in the Relay Server Guide.

PROBLEM: License Check Failed 2 Error Message displayed
The license file may have been changed. If the License File is modified, the license will fail. If you move the Relay Server Software to a different computer, the new PC will need to be licensed to operate the software.
SOLUTION: If you cannot return the license file to the proper ID, repeat the licensing procedure described in Section 1 of this manual, or call IVC with the MAC Number for the Relay Server PC.

PROBLEM: License Check Failed 3 Error Message displayed
This is caused by having the wrong MAC Number in the license or using the license file on a different computer than the computer you got the license for.
SOLUTION: Repeat the licensing procedure described in Section 1 of this manual, or call IVC with the MAC Number for the new Relay Server PC.

PROBLEM: License Check Failed 4 Error Message displayed
IVC Cameras with model numbers PTZ-xxxx-S require "Camera Licenses". If the Relay Server is configured for PTZ-xxxx-S and none are connected or aren't properly configured the "License Check Failed 4" message will appear even if you have the Relay Server properly licensed. You will also notice the video feed is "Disabled" in the Video Feeds and Passwords section of the View Manager.
SOLUTION: Make sure the camera is powered and it is properly connected to the network. If yes, contact IVC for a "Camera" license file.

PROBLEM: When using "Continuously Stored Video" the system occasionally stops saving, or saves intermittently.
There are two possible reasons for this behavior. The disk is intermittently full or there are extraneous files in the archive directories.
SOLUTION: First is check the settings in Tools, View Manager, System Manager, Relay Server Configuration.

Figure B-1

If **Stop Saving Video** is selected, video storage will stop once the disk if full. If **Delete Oldest Files** is selected, video storage will not stop when the allocated disk space is full. In this mode, oldest video is automatically overwritten by the newest stored video. If operating in the "Delete Oldest Files" mode does not remove the problem, check to see if there are files in the archive directory that do not belong there. The Relay Server will not delete files it does not put there, and they may hang the routine that should be deleting files video files from the archives. You should manually delete any such extraneous files.

PROBLEM: Incorrect focus at high zoom levels.
All auto-focus cameras employ techniques to set focus based on some fixed criteria. The camera cannot know what you want to focus on so it may focus on something closer or farther than what you are interested in. It might focus on rain or dirt on the dome lens. This problem is worse in low light and when the camera is operating in a Digital Zoom range that "pixilates" the image. (Don't confuse high zoom pixilization with poor focus.)
SOLUTION: Try setting focus using the "focus bar" on the Main Control Panel. Notice there are three "focus in" and three "focus out" buttons on the bar. Also notice that you can manually set focus in the Create Presets page in the View Manager and then check "Save Focus".

PROBLEM: Video Manager cannot send commands to the video camera Error Message displayed

This message indicates an inoperative or disconnected camera, or the Relay Server is not configured properly.

SOLUTION: Make sure the camera is powered and properly connected to the network and ultimately to the Relay Server. This can be done by pinging the camera (To ping the camera click the Windows Start Menu, Run, enter CMD, type ping_xxx.xxx.x.xx where xxx.xxx.x.xx is the IP address for the camera server.

Also check to see if the Relay Server is configured properly. Tools, View Manager, System Manager, Factory Settings, Pan tilt Settings. Refer to the camera setup information in the Camera Installation Guide for this camera or Appendix A of this manual to see if the proper **Pan/Tilt Code** and **Camera Code** for the camera model you are using are entered. If you make changes, be sure to c*lick* Save Settings at the bottom of the page.

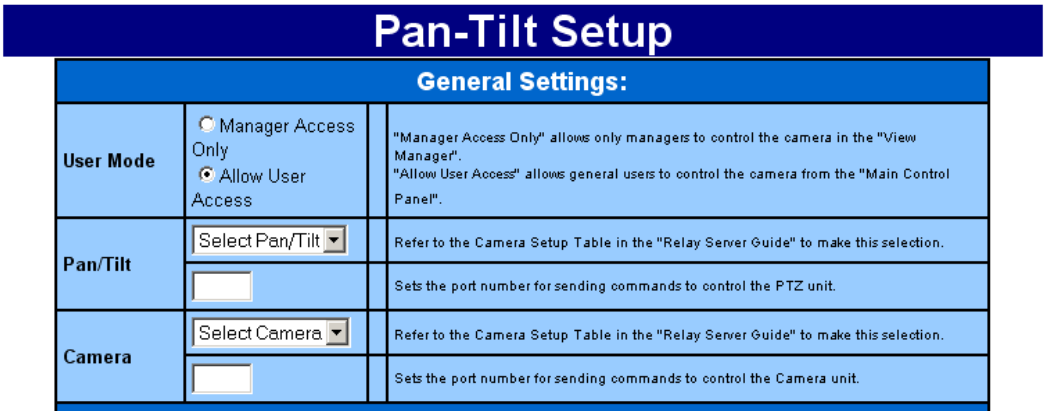
Pan-Tilt Setup
General Settings:
User Mode
Manager Access Only
Allow User Access
"Manager Access Only" allows only managers to control the camera in the "View Manager".
"Allow User Access" allows general users to control the camera from the "Main Control Panel".
Pan/Tilt
Select Pan/Tilt
Refer to the Camera Setup Table in the "Relay Server Guide" to make this selection.
Sets the port number for sending commands to control the PTZ unit.
Camera
Select Camera
Refer to the Camera Setup Table in the "Relay Server Guide" to make this selection.
Sets the port number for sending commands to control the Camera unit.

Figure B-2

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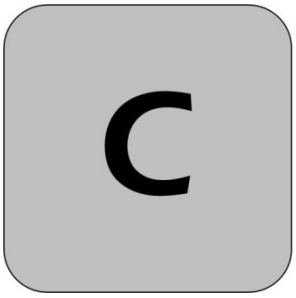


ActiveX API

IV&C
Industrial Video and Control

IVC's ActiveX Component

Revisions

October 2002 First Release

February 2003 Added the Click method, and the Username, Password, PrivUsername, PrivPassword,

and Exclusive properties.

April 2003 Add the Timeout and Image properties

August 2006 Add ExclusiveTimeout and ExclusivePriority properties.

September 26, 2007

1. Indicate deprecated properties and methods. They are FramesPerSecond, Exclusive, PrivUsername, PrivPassword, ExclusiveTimeout and ExclusivePriority.
2. Add Priority and OverrideTimeout properties

March 05, 2008

1. Add "SocketReadWriteTimeout" property to support RelayServer serves very low frame rate. The old "Timeout" property serves as the socket connect timeout. Populate both connect and read/write timeout property values down to the low level socket calls.

Introduction

IVC is pleased to furnish an ActiveX® software component for use with IVC's line of controllable video products. If you create integrated end-user solution software and you need to integrate video monitoring or surveillance, this software component is for you. We have designed it for use in a variety of solution development environments on the Microsoft® Windows® platform, including:

- Web applications based on Microsoft Internet Explorer (version 5 and higher)
- Microsoft Visual Basic (version 6 and higher)
- Microsoft Visual C++ (version 6 and higher)
- Wonderware® InTouch WindowMaker and WindowViewer
- Iconics® Genesis-32 GraphWorx32 (version 6 and higher) and related software

If you develop customized solution software and you wish to build live and controllable video windows into your solutions, IVC's ActiveX component makes it easy.

IVC's ActiveX component must be installed on each computer used for solution development, and each computer used for solution deployment. It is furnished to developers and end-users without charge for use with other IVC products. If you are a solution developer for IVC products you may freely redistribute the component to any and all end-users of IVC products.

This document describes the IVC ActiveX component. For best results you should have experience with one of the Windows-based solution development environments which incorporate Active X.

Features and Functions

The IVC ActiveX component offers a simple but powerful set of features to IVC solution developers and users.

- Live Streaming Video: By placing the component into a software solution you may build video into that solution. For example, an alarm screen in an industrial control solution may show details of the alarm and a video of the device issuing the alarm.
- Controllable Video Streaming: The solution developer may enable and disable video streaming, and choose an appropriate frame rate, for each application.
- Steerable Video: IVC's steerable video allows the end-user to point to objects in the video and take a closer look. The IVC ActiveX component supports point-and-click to look and zooming. The point-and-click to look is configurable.
- Full ActiveX standards compatibility: The component meets Microsoft requirements for a safe, scriptable, and data-bound ActiveX control.
- Configurability: A solution developer may configure the component using a built-in dialog box, and also programmatically via simple scripting interfaces.
- Simplicity for end-users: End-users of custom solutions have as little or as much control over the video system as the solution-developer wishes.
- Small size and simplicity: The IVC ActiveX component consists of a single software file approximately 150K in size.
- Efficiency and scalability: The IVC ActiveX component is suitable for creating video display applications showing the images from dozens of video cameras on a single computer monitor.
- Compatibility with the IVC product line: The IVC ActiveX component integrates seamlessly over intranets, extranets, and the public Internet with IVC's relay server products.

Distribution and Installation

IVC's ActiveX component, when it is installed on a Windows computer, consists of a single file – a self-contained dynamic-link-library for Windows – about 150kB in size. It is very simple to use for development and deployment: the same exact software is used for development and deployment.

To install the component, simply download and run the installer. It will place the component on your computer and make it available for use.

Or, you can visit the web page http://www.ivcco.com/activex/ using Internet Explorer. This web page installs the component automatically.

Developing a Live Controllable Video Application in Visual Basic

This is a simple example of the use of IVC's ActiveX component.

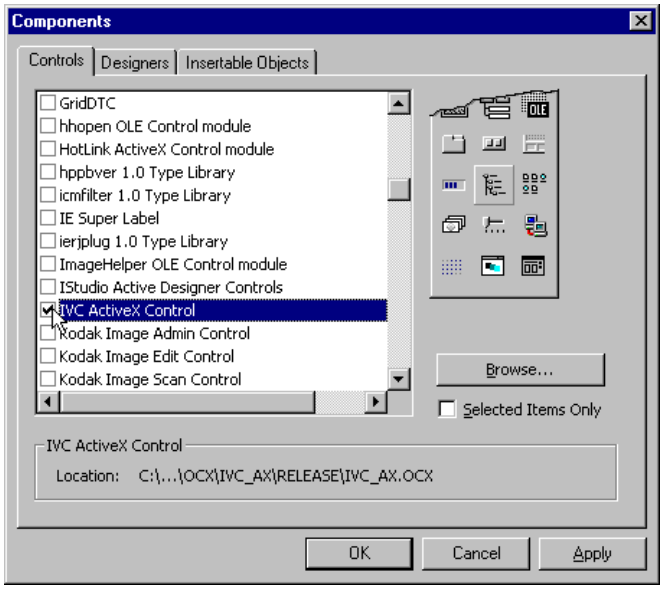
To build a simple Visual Basic controllable video solution, use the following steps.

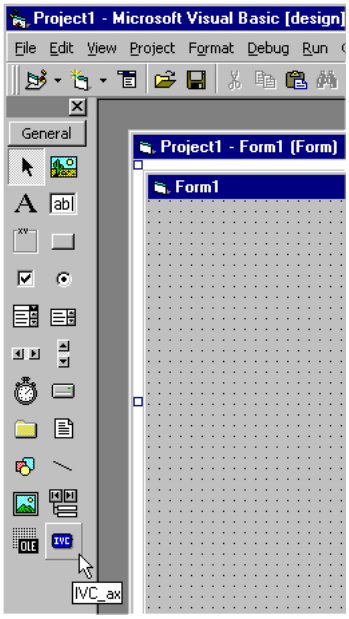
1. Ensure the IVC ActiveX Component is installed on your computer.

2. Start Visual Basic and choose a new “Standard EXE” project.

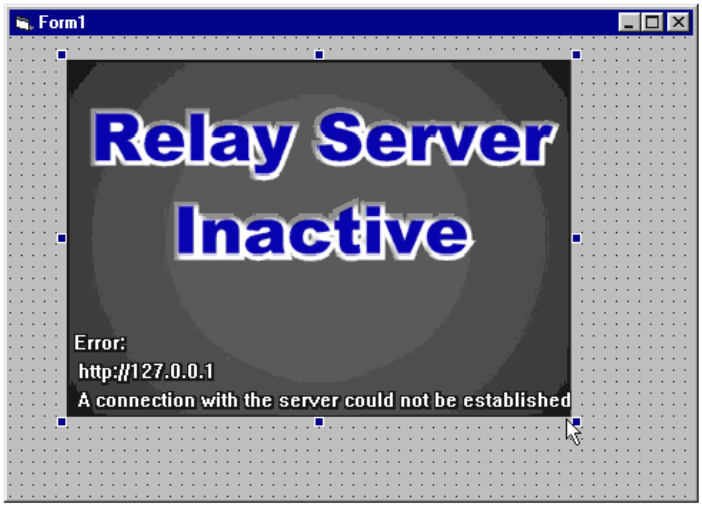
3. Add the IVC Component to your project. Choose Components… from the Project menu.

4. In the Components dialog box, locate the IVC ActiveX Control, select it, and press the OK button. The IVC icon appears at the bottom of the Visual Basic designer palette.



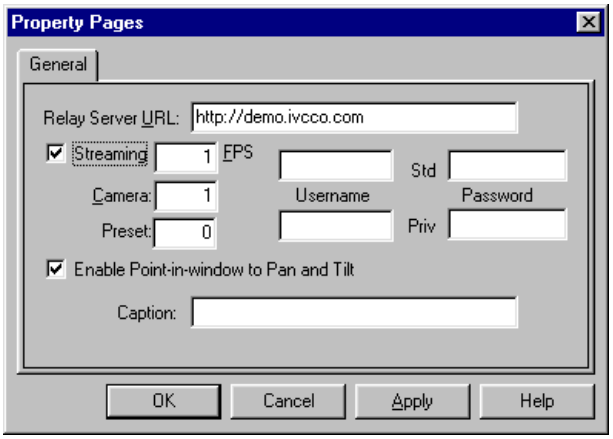


5. Choose the IVC icon, and then draw a control on the Form in your Visual Basic window. The video window sizes itself to an appropriate size, and displays itself on your screen. If you are running an IVC Relay Server on your development computer, a video image will appear. However, ordinarily you will see an error frame indicating that no Relay Server is responding. This is normal.



6. Press the right mouse button on top of the video window (anywhere in the frame) and choose the Properties item.

7. Enter the URL of a valid IVC Relay Server into the Properties dialog box and press OK. You may also choose an appropriate streaming frame rate, camera number, and preset if you wish. Use a Relay Server in your organization, or if you wish you may use http://demo.ivcco.com for testing purposes.



8. At this point the error frame should disappear and a video picture should appear.

9. Add Visual Basic buttons to zoom in and out. Choose the button icon from the Visual Basic palette, place a button to the left of the video frame, and type a left angle bracket <. Repeat for a button to the right. The buttons should appear on the screen next to the video frame.

10. Next hook up the buttons to the IVC ActiveX video component, using two lines of Basic. To do this double-click on the left button and type the following line of code:

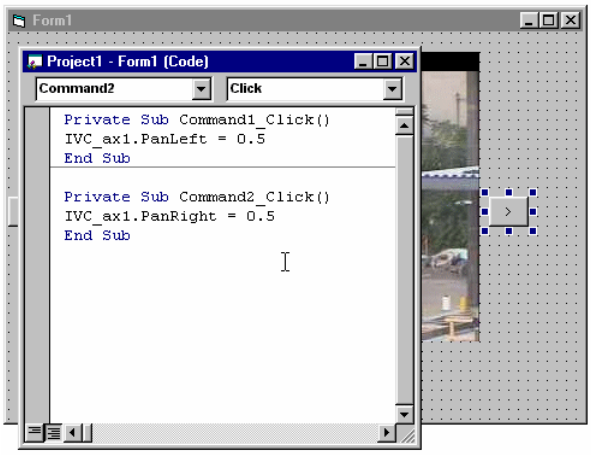
ivc_ax1.PanLeft = 0.5

Repeat this step for the right button, and type the following line of code:

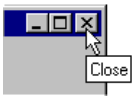
ivc_ax1.PanRight = 0.5

Each of these lines of code indicates that whenever each button is pressed, the video object (named “ivc_ax1”) should pan half the visible field.

When you have finished typing these lines Visual Basic’s code display should look something like this.



11. You now have a ready-to-run custom video solution (a very simple one to be sure). Run it: Press the Start button in the Visual Basic toolbar. Try clicking the buttons – the image pans left and right. Try clicking in the video frame – the image centers where you click. When you’re done trying out your new video application, click the X icon at the upper right of your window to close it and return to Visual Basic.



Properties

When you decide to develop a more sophisticated video application, you'll need to know the names and functions of the IVC ActiveX Component Properties. Each of the properties allows you to control some aspect of the component from your program. The table describes each of the properties. It explains each property, and tells whether you can set it from your Integrated Development Environment (IDE), from the property sheet, and at runtime.

Property Name	Meaning when set	Meaning when queried	Type of data	Settable
Active	True (1) causes the video frame to be displayed and updated. False (0) displays a gray background and shuts off video reception	True (1) means video is being received, and False (0) means it is shut off.	True or False (1 or 0)	From IDE and at runtime
Camera	Chooses a particular camera (video feed) on the relay server.	No reliable meaning.	Small number from 1 up	From property sheet, from IDE, and at runtime
FramesPerSecond (deprecated)	Chooses a rate for displaying frames.	Indicates the chosen frame rate.	Number between 1 and 30	From property sheet, from IDE, and at runtime
FramesPerSecond2	Chooses a rate for displaying frames.	Indicates the chosen frame rate.	Number between 0.01 and 30.0	From property sheet, from IDE, and at runtime
Image		The JPEG data for the image currently being displayed	String, potentially very long, with embedded null characters.	Not settable

PanLeft	Causes the camera to pan to the left by the chosen amount. Setting this to 0.5, for example, makes the camera pan to the left by half a video field.	No reliable meaning.	Decimal number, for example 0.5 or 1.5.	At runtime only
PanRight	Causes the camera to pan to the right by the chosen amount.	No reliable meaning.	Decimal number	At runtime only
TiltUp	Causes the camera to tilt up by the chosen amount.	No reliable meaning.	Decimal number	At runtime only
TiltDown	Causes the camera to tilt down the by the chosen amount.	No reliable meaning.	Decimal number	At runtime only
Timeout	The number of seconds to wait before giving up on a network connection request	Indicates the timeout setting	Number of seconds	From IDE and at runtime
SocketReadWriteTimeout	The number of seconds to wait before giving up on a network read/write request	Indicates the timeout setting	Number of seconds	From IDE and at runtime
Preset	Chooses a particular preset position	No reliable meaning	Small Number from 1 up	From property sheet, from IDE, and at runtime

RelayServerURL	Specifies the network address of the Relay Server to display	Indicates the chosen Relay Server's network address	Text, for example, http://demo.ivcco.com	From property sheet, from IDE, and at runtime
StreamVideo	True (1) causes video to be streamed. False (0) displays a still image, updated whenever Active is set to true or any other Property is set.	Indicates whether streaming video is being displayed.	True or False	From property sheet, from IDE, and at runtime
EnablePoint	True(1) enables the user to point to something in the window and click it to cause the camera to pan and tilt to center it.	Indicates whether the point-in-window feature is activated.	True or False	From property sheet, from IDE, and at runtime
ZoomLevel	Setting this to 0 zooms out the camera one step. Setting it to 11 zooms in one step. Setting it to a value from 1-10 sets the zoom to the chosen level.	No reliable meaning.	Number between –1 and 11	From IDE and at runtime, to an absolute zoom value between 1 and 10
Caption	Specifies a caption to display at the lower left of the video window.	Indicates the caption.	Text. When %u appears in the string, the Relay Server URL is displayed. If %c appears, the camera number is displayed. %w and %h cause the display of the width and height of the video window.	From property sheet, from IDE, and at runtime

Exclusive (deprecated)	Setting this to True (1) enables exclusive access to the camera control function. Setting it to False (0) disables exclusive access. .	Returns the best guess of current state of Exclusive mode. The property automatically is reset to False after the period of inactivity mentioned in ExclusiveTimeout.	True or False	From IDE and at runtime. The function of this property depends upon PrivUsername and PrivPassword values being set correctly. Application software must set this property to True regularly to keep Exclusive mode in effect.
PrivUsername (deprecated)	Specifies the System Manager username for access to the Exclusive function.	Indicates the username.	Text. Set to blank if the relay server is not configured to require a System Manager password.	From property sheet, from IDE, and at runtime
PrivPassword (deprecated)	Specifies the System Manager password for access to the Exclusive function.	Indicates the password.	Text. Set to blank if the relay server is not configured to require a System Manager password.	From property sheet, from IDE, and at runtime
ExclusiveTimeout (deprecated)	The number of seconds for which an Exclusive-access request should persist.	Number of seconds most recently set.	Seconds	From IDE, and at runtime

ExclusivePriority (deprecated)	The priority to use for Exclusive access.	Priority most recently set.	A number: 0 is normal. 1,2,3 are above-normal. –1 and –2 are below-normal.	From IDE, and at runtime. The IVC Relay Server Software limits the actual priority to the value authorized for the user named in PrivUsername.
Username	Specifies a username for accessing to the relay server.	Indicates the username.	Text. Set to blank if the relay server is not configured to require a password.	From property sheet, from IDE, and at runtime
Password	Specifies a password for general (nonprivileged) access to the relay server.	Indicates the password.	Text. Set to blank if the relay server is not configured to require a password.	From property sheet, from IDE, and at runtime
Priority	The priority to use for controlling the camera.	Priority most recently set.	A number between 1 and 6. 1 is normal and 6 is high.	From IDE, and at runtime. The IVC Relay Server Software limits
OverrideTimeout	The number of seconds for which an user access request should persist.	Number of seconds most recently set.	Seconds	From IDE, and at runtime. The IVC Relay Server Software limits
ImageHeight	The height of the image.	Number of pixels of the image height.	Pixels	From IDE, and at runtime. The IVC Relay Server Software limits
ImageWidth	The width of the image.	Number of pixels of the image width.	Pixels	From IDE, and at runtime. The IVC Relay Server Software limits

Notice that the lines of code mentioned in Step 10 of the Visual Basic program set the PanLeft and PanRight properties. Various solution-development environments offer different ways for the developer to set and query the properties of components; consult your favorite environment's documentation for details.

Methods

The ActiveX control offers two Methods that may be called from other software.

CenterAt (x,y)

SendCommand (command)

CenterAt(x, y)

Ordinarily if the EnablePoint property is set to true, when the user clicks in the displayed image the camera moves to center the clicked-on point in the center of the image. The CenterAt method allows software to simulate clicking in the image. The x and y parameter indicate the position within the image at which the simulated click occurs.

For example, this Visual Basic command pans the camera up and to the left.

Call CenterAt (10,10)

This method does not return any value.

SendCommand (command)

This method sends an arbitrary command to the relay server (at the URL specified by the property RelayServerURL). Some substitutions are made in the command string before sending it, as follows:

%c – the camera current number.

%u – the relay server URL. This is not necessary to get the command sent to the right server.

%f – the requested frame rate in frames per second.

%m – either "manage" or "control" depending on whether Exclusive mode is current.

%% – a single "%" character.

For example, this Visual Basic command sets the zoom level to 1 on the current camera.

Call SendCommand("/control/%c/cmd=dir&dir=z&dist=1")

Notice that valid command strings start with the "/" character. Command strings are described in the document entitled *IVC Relay Server HTTP API.* Note also that commands are queued and processed one at a time, and that commands that have aged more than three seconds in the queue are discarded.

This method does not return any value.

Using the Image property to take snapshots in Visual Basic

The Image property allows a Visual Basic or other program to retrieve the JPEG image data for the image currently displayed at runtime. This makes it easy for such a program to implement a "snapshot" function.

To use the Image property in Visual Basic, you might for example create a Snapshot button for a user to click. The Click handler for your button would look like this:

```
Private Sub Snapshot_Click()
  Dim Img As String
  Dim Imglen As Long
  Img = IVC_ax1.Image
  Imglen = Len(Img)
  If Imglen > 0 Then
    Imgfile = FreeFile()
    Open "C:\temp\snapshot.jpg" For Binary Access Write Lock Write As #Imgfile
    Put #Imgfile, , Img
    Close #imgfile
  End If
End Sub
```

This handler retrieves the value of the Image property. It then examines its length (if the length is zero, no image is available). It then opens a file called "snapsnot.jpg" in the C:\TEMP folder, and stores the file. This file, a standard JPEG file, can be displayed using a web browser or any other suitable program.

Using the IVC ActiveX Component in Web Pages

The IVC ActiveX Component can be used in custom web pages to offer video capability. These web pages may be displayed by Microsoft Internet Explorer. Of course, IVC video can be displayed in web pages without the need for an ActiveX component as well. You would incorporate the ActiveX Component in a page if you wanted the ability to control the video with scripts.

To use the component in a web page, you use the OBJECT tag in the page's HTML. The Object tag for the IVC component looks like this:

```
<OBJECT CLASSID="clsid:AD7E110C-F0F3-4574-B4BE-E69F5193BFA7"
        CODEBASE="http://www.ivcco.com/activex /ivc_ax.cab#version=1,0,2,7"
        ID="ivc_ax"
        WIDTH="352"
        HEIGHT="240"  >
  <PARAM name=RelayServerURL value="http://demo.ivcco.com">
  <PARAM name=Camera value=1>
  <PARAM name=StreamVideo value=0>
```

```
    <PARAM name=FramesPerSecond value=2>
</OBJECT>
```

You must specify the CLASSID value *exactly* as shown here, without any deviations whatsoever.

You may omit the line with the CODEBASE on it if you are sure the visitors to your web site have the control installed. You may change the CODEBASE's URL if you are serving the ivc_ax.cab file from some other location.

You may give the video frame a name using the ID value. This facilitates scripting.

The WIDTH and HEIGHT values describe the size of the video frame in the web page. 352x240 is normal North American video size. Large video frames are 704x480.

The remaining PARAM items allow you to set the properties of the component, as described in the table. Provide a PARAM item for each property you wish to set.

A Sample Scripted Web Page

This example shows a web page including a video frame and some Javascript to control it. The page contains buttons to turn on and off streaming, to pan and zoom the camera, and to choose presets. It includes a couple of dropdown lists to choose the camera to view and the frame rate. The web page looks like this:

The page's HTML code is this:

```
<HTML>
<HEAD>
<title>IVC ActiveX Sample</title>
</HEAD>
<BODY>
    <OBJECT classid="clsid:AD7E110C-F0F3-4574-B4BE-E69F5193BFA7"
        id="ivc_ax"
        width="352"
```

```
        height="240" >
        <PARAM name=RelayServerURL value="http://demo.ivcco.com">
        <PARAM name=Camera value=1>
        <PARAM name=StreamVideo value=0>
        <PARAM name=FramesPerSecond value=2>
    </OBJECT>
    <INPUT type="button" value="Pan Left" name="BtnPanLeft"  onClick="PanLeft(.99)">
    <INPUT type="button" value="Pan Right" name="BtnPanRight"  onClick="PanRight(.99)">
    <INPUT type="button" value="Zoom Out" name="BtnZoomIn"  onClick="SetZoom(0)">
    <INPUT type="button" value="Zoom In" name="BtnZoomOut"  onClick="SetZoom(11)">
    <INPUT type="button" value="Stream On" name="VStreamOn"
onClick="VideoStreamOn()">
    <INPUT type="button" value="Stream Off" name="VStreamOff"
onClick="VideoStreamOff()">
    <INPUT type="button" value="Preset 1" name="GoToPreset1"  onClick="GoToPreset(1)">
    <INPUT type="button" value="Preset 2" name="GoToPreset2"  onClick="GoToPreset(2)">
    <INPUT type="button" value="Preset 3" name="GoToPreset3"  onClick="GoToPreset(3)">
    <SELECT name="cams" onChange="SelectCam( this.options[this.selectedIndex].value )">
            <OPTION value="1">1
            <OPTION value="2">2
            <OPTION value="3">3
    </SELECT>
    <SELECT name="FPS" onChange="SetFPS( this.options[this.selectedIndex].value )">
            <OPTION value="1">1
            <OPTION value="2">2
            <OPTION value="3">3
            <OPTION value="4">4
            <OPTION value="5">5
            <OPTION value="6">6
            <OPTION value="7">7
            <OPTION value="8">8
            <OPTION value="9">9
            <OPTION value="10">10
    </SELECT>
</BODY>
 <SCRIPT LANGUAGE="JScript">
function SelectCam( val ) {ivc_ax.Camera = val}
function SetFPS( val ){ivc_ax.FramesPerSecond = val }
function PanLeft( val ) {ivc_ax.PanLeft = val}
```

```
function PanRight( val ) {ivc_ax.PanRight = val }
function SetZoom( val ) {ivc_ax.ZoomLevel = val }
function VideoStreamOn() { ivc_ax.StreamVideo = 1 }
function VideoStreamOff() {ivc_ax.StreamVideo = 0 }
function GoToPreset( val ) { ivc_ax.Preset = val  }
</SCRIPT>
</HTML>
```

Programming Tips

When your program is not displaying a video stream (for example if you set form.Visible to False in Visual Basic) it is a good idea also to set the IVC ActiveX control's Active property to False as this will disconnect the streaming video and reduce the consumption of network bandwidth. When making the video stream visible again set the Active property back to True.

You may use the Caption property to help you troubleshoot application and network problems. To do this, insert special strings (like %u) into the value you set into the Caption property. When the caption is displayed it substitutes values for the special strings. The special strings are:

String	Meaning
%u	Relay Server URL
%c	Camera number
%f	Frames per second (0 if Streaming is not set to True)
%w	Onscreen video window width
%h	Onscreen video window height
%q	Number of video frames retrieved from relay server by this component since it started running.
%r	Number of video frames displayed by this component since it started running. Note that this number may be smaller than the number of video frames retrieved if the computer cannot keep up with displaying video, or if the video window is obscured.
%s	Number of commands to relay server (e.g. to pan, tilt, zoom, choose a preset, etc) accepted by this component from the user or from the custom application it is built into.
%t	Number of commands to relay server completed and acknowledged. This number is smaller than the number of commands accepted when the relay server has delays in processing commands.
%%	A simple percent sign.

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D

Video Storage and Retrieval

IV&C
Industrial Video and Control

Calculating Space Required for Video Storage

The parameters under which video storage takes place are described in earlier sections of this manual. These include:

- Specifying where the video is stored. The root directory structure for stored video and snapshots is a global setting defined in the System Manager Relay Server Configuration Panel.
- For each camera, the storage method and storage frame rate are defined in the Video Feeds and Passwords page of the System Manager.

In every video system that requires the storage of video streams, the key question is always, "How much storage capacity do I need?"

The answer to this question can be found with some simple calculations that include the following variables:

1. The number of cameras for which you will be recording.
2. The compression method used.
3. The recording frame rate for each camera.
4. The recording resolution for each camera.

A video storage calculator can be found on the IVC website at http://www.ivcco.com/support/VideoStorageCalculator.xls.

This calculator makes the following assumptions:

1. All recording uses M-JPEG compression.
2. All cameras record at the same frame rate and resolution.
3. Recording is continuous.

It is important to note the calculating storage requirements for a network of IP cameras is an inexact science. No one IP camera type or IP encoder type compresses video exactly the same way. Therefore, even though operating parameters might appear to be identical from one camera to the next, it is entirely possible the storage file sizes might be slightly different. Consequently, it is a good idea to add some contingency disk space to allow for these differences.

It is also important to note that enabling the tamper detection digital watermark will increase the size of the saved file. With this in mind, the approximate M-JPEG video frame sizes commonly encountered are:

1 CIF (352 x 240) resolution:	8.4KB
4 CIF (704 x 480) resolution:	26.2KB

Frame sizes for megapixel and other large format cameras will obviously be larger. Consult the specifications of your camera to determine the appropriate frame size.

In general, the formula to calculate the amount a single camera will require for one day of continuous storage is:

*Frame Rate * Frame Size * 86400 seconds/day = Space required per day*

For example, the amount of storage space required to store one day's worth of M-JPEG video from a camera set to 352x240 resolution and a frame rate of five frames per second would be:

5 FPS * 8.4KB/Frame * 86400 seconds/day = 3628800KB or about 3.6GB/day

MPEG-4 and H.264

Other compression methods supported by the IVC Relay Server include MPEG-4 and H.264. To accomplish the desired compression these methods essentially only transmit changed pixels instead of contiguous full frames of pixels as would be found if viewing or storing M-JPEG. Consequently, the amount of video information transmitted or saved using MPEG-4 or H.264 greatly depends on the amount of activity in the scene. MPEG-4 file sizes for scenes with little or no activity would be smaller than file sizes from the same camera if there was a lot of activity in the scene. This makes the task of predicting required storage capacity when using these compression methods more difficult. If you are planning on storing MPEG-4 or H.264 files, we recommend calculating the required storage for M-JPEG and using ten percent of the result. Using the numbers above, the approximate MPEG-4 frame sizes would be:

1 CIF (352 x 240) resolution:	0.84KB
4 CIF (704 x 480) resolution:	2.62KB

Calculating Total Required Storage

Using our storage calculator or your own calculator, repeat the operations described above for each camera. Add all of the results and then, add about 10% for contingency. This should give you sufficient capacity to satisfy your continuous storage needs.

Event-base Storage

In many applications, continuous storage is not very efficient or cost-effective. In most cases, you are recording nothing happening. Should an event occur, operators need to sort through or review many video files not associated with the event. Using facilities of IVC's Relay Server Software and View Station Software, it is possible to initiate recording only when desired. This could be as a result of an alarm or some other unexpected event, or as result of a scheduled activity. In either case, the size and cost of the storage capacity required could be greatly reduced. Since you are only recording events, this also makes the job of reviewing video much easier. Contact IVC Support if you have any questions about event-based recording.

Video Retrieval

Retrieval and playback of stored video can be accomplished via the Relay Server web interface or through a user-defined view created by IVC's View Station Software. This section describes the use of the player provided with the Relay Server Software. Consult the IVC View Station Users Guide for details on adding and using a player in an operator's view.

To access stored video or snapshots, select **View Video and Snaps** from the Tools menu on the Main Control Panel.

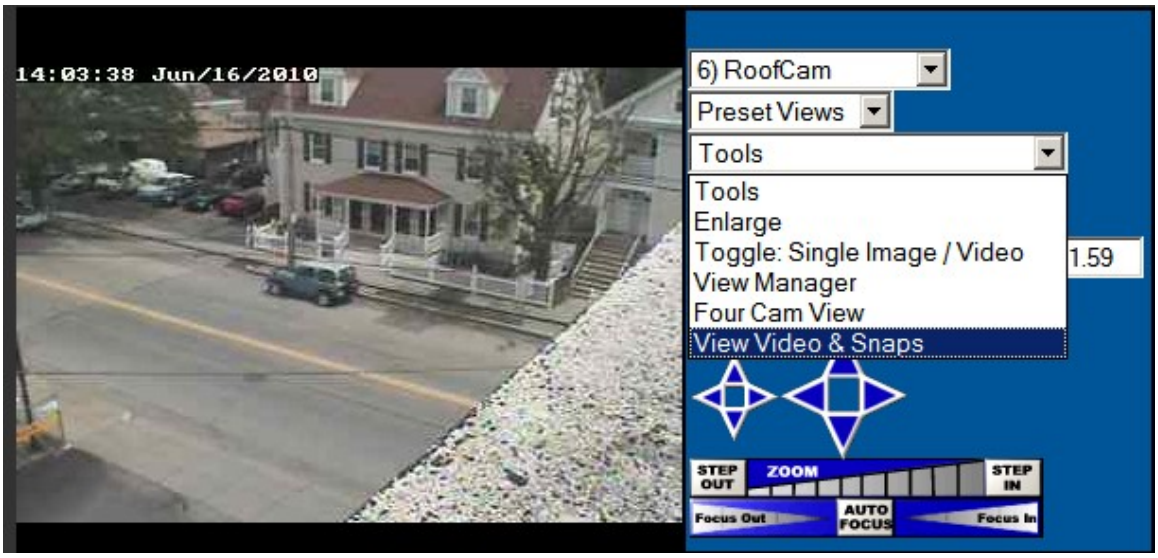


Figure 44

The Relay Server will display the following page:

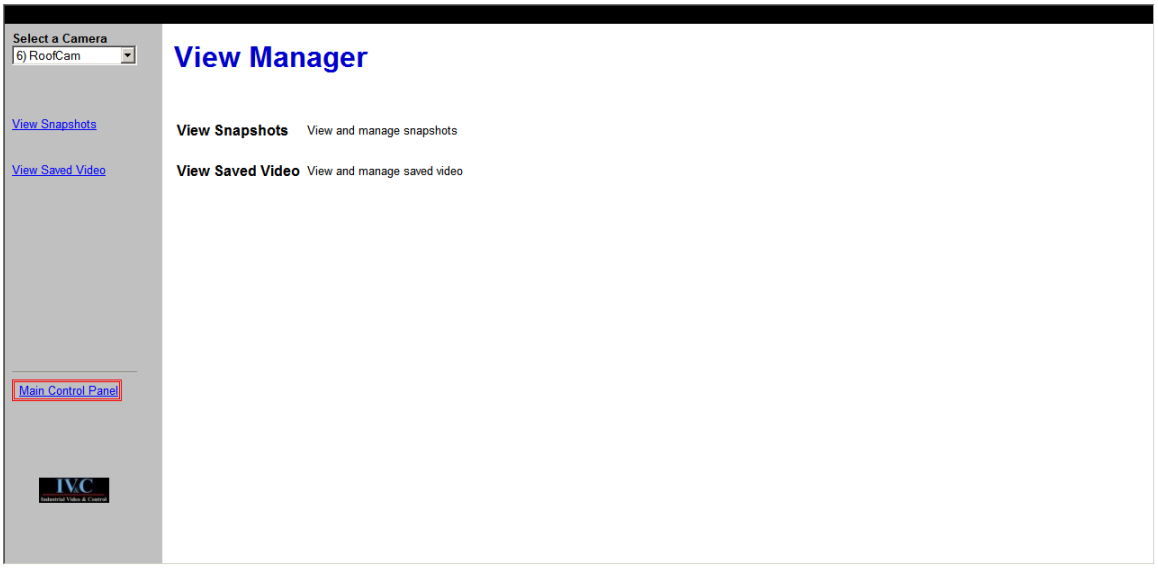


Figure 45

From the drop down menu select the camera for which you wish to retrieve archived video or snapshots.

Viewing Snapshots

Snapshots are single JPEG images stored on the Relay Server as a result of commands initiated from the Relay Server, IVC View Station Software, or from an API command in a third-party application. Snapshots are stored as shown below in Fig. 46.

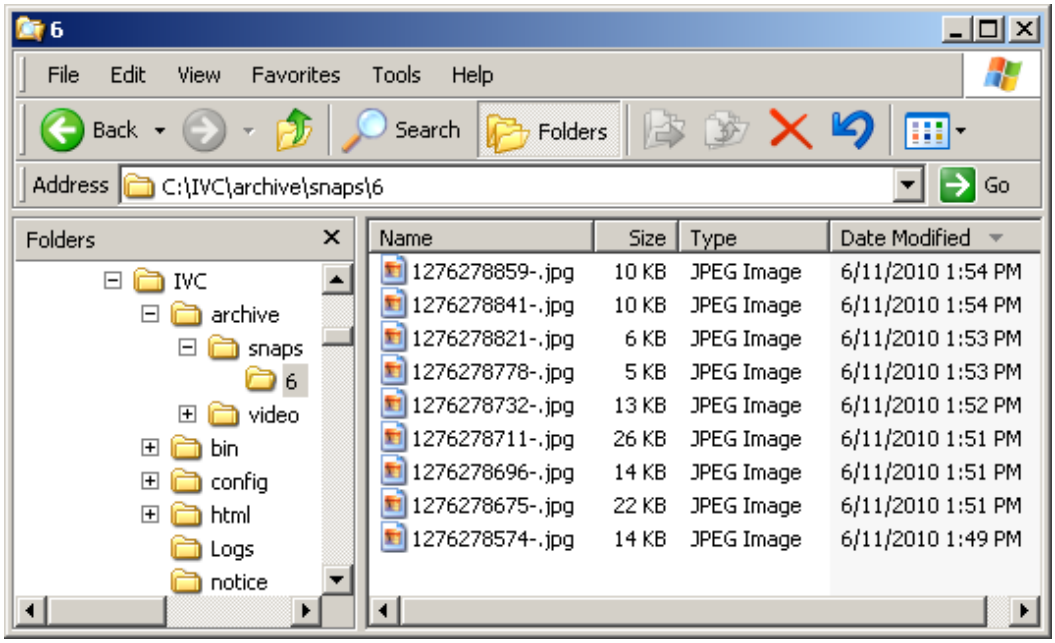


Figure 46

The number of the folder containing the JPEG images corresponds to the ID number of the camera. In our example folder 6 contains the saved snapshots for RoofCam. As these snapshots are stored in a standard format, any picture viewer can be used to open these files. To access these files remotely, click on the **View Snapshots** link on the Relay Server View Video and Snaps web page (Fig. 45). The Relay Server will list all of saved snapshots for the selected camera (Fig. 47).

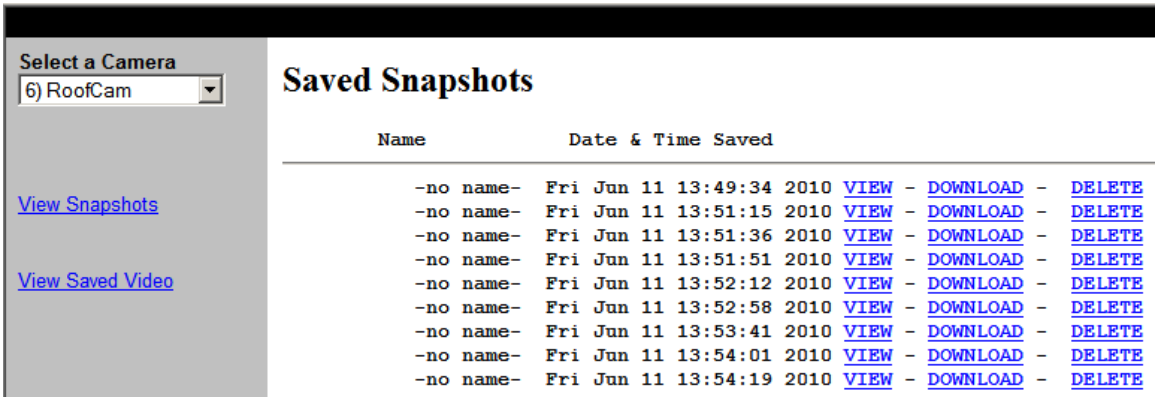
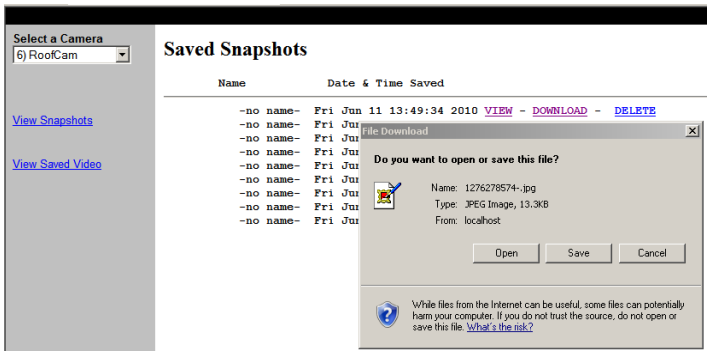

Select a Camera
6) RoofCam
View Snapshots
View Saved Video
Saved Snapshots
Name Date & Time Saved
-no name- Fri Jun 11 13:49:34 2010 VIEW - DOWNLOAD - DELETE
-no name- Fri Jun 11 13:51:15 2010 VIEW - DOWNLOAD - DELETE
-no name- Fri Jun 11 13:51:36 2010 VIEW - DOWNLOAD - DELETE
-no name- Fri Jun 11 13:51:51 2010 VIEW - DOWNLOAD - DELETE
-no name- Fri Jun 11 13:52:12 2010 VIEW - DOWNLOAD - DELETE
-no name- Fri Jun 11 13:52:58 2010 VIEW - DOWNLOAD - DELETE
-no name- Fri Jun 11 13:53:41 2010 VIEW - DOWNLOAD - DELETE
-no name- Fri Jun 11 13:54:01 2010 VIEW - DOWNLOAD - DELETE
-no name- Fri Jun 11 13:54:19 2010 VIEW - DOWNLOAD - DELETE

Figure 47

As Fig. 47 illustrates, the named files are listed in chronological order with date- and time-stamp. Note if the file was created without a name "**–no name-**"will appear as the file name. Additionally the user is presented with links to provide the following options:

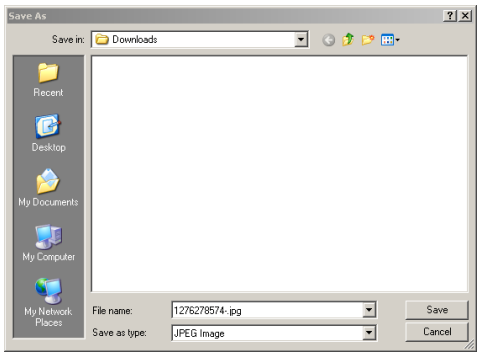
- **VIEW** - Click this link to view the image in a separate window.

- **DOWNLOAD** - Click this link to open this file with your default JPEG viewer or save this image to another location.


Select a Camera
6) RoofCam
View Snapshots
View Saved Video
Saved Snapshots
Name
Date & Time Saved
-no name- Fri Jun 11 13:49:34 2010 VIEW - DOWNLOAD - DELETE
File Download
Do you want to open or save this file?
Name: 1276278574-.jpg
Type: JPEG Image, 13.3KB
From: localhost
Open
Save
Cancel
While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not open or save this file. What's the risk?

Click the **Open** button in the File Download dialog that appears to open the JPEG file in your default viewer (Microsoft Photo Editor, Paint, etc.). Once open you may edit the file as required.

Click the **Save** button in the Download dialog to save the image to another location. In the resulting Save As dialog specify a location and file name as required.



- **DELETE** - Click this link to delete the image file from the Relay Server. Once deleted, the file cannot be retrieved.

Viewing Stored Video

Video files are stored on the Relay Server as a result of commands initiated from the Relay Server, IVC View Station Software, or from an API command in a third-party application. Video files are stored as shown below in Fig. 48.

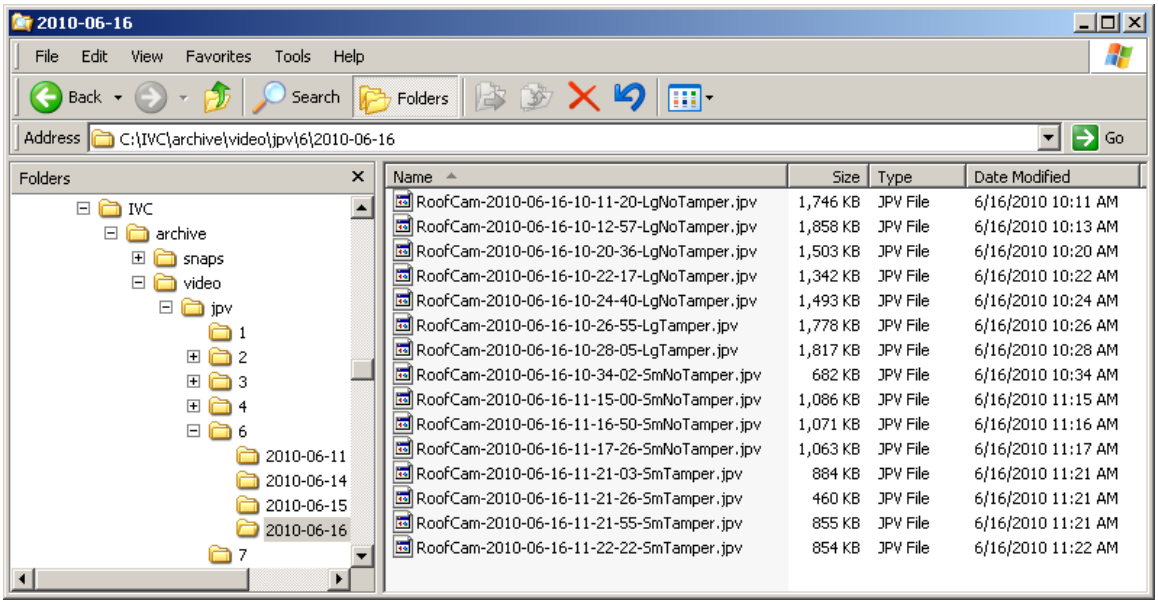

2010-06-16
File Edit View Favorites Tools Help
Back Search Folders
Address C:\IVC\archive\video\jpv\6\2010-06-16
Go
Folders
IVC
archive
snaps
video
jpv
1
2
3
4
6
2010-06-11
2010-06-14
2010-06-15
2010-06-16
7
Name Size Type Date Modified
RoofCam-2010-06-16-10-11-20-LgNoTamper.jpv 1,746 KB JPV File 6/16/2010 10:11 AM
RoofCam-2010-06-16-10-12-57-LgNoTamper.jpv 1,858 KB JPV File 6/16/2010 10:13 AM
RoofCam-2010-06-16-10-20-36-LgNoTamper.jpv 1,503 KB JPV File 6/16/2010 10:20 AM
RoofCam-2010-06-16-10-22-17-LgNoTamper.jpv 1,342 KB JPV File 6/16/2010 10:22 AM
RoofCam-2010-06-16-10-24-40-LgNoTamper.jpv 1,493 KB JPV File 6/16/2010 10:24 AM
RoofCam-2010-06-16-10-26-55-LgTamper.jpv 1,778 KB JPV File 6/16/2010 10:26 AM
RoofCam-2010-06-16-10-28-05-LgTamper.jpv 1,817 KB JPV File 6/16/2010 10:28 AM
RoofCam-2010-06-16-10-34-02-SmNoTamper.jpv 682 KB JPV File 6/16/2010 10:34 AM
RoofCam-2010-06-16-11-15-00-SmNoTamper.jpv 1,086 KB JPV File 6/16/2010 11:15 AM
RoofCam-2010-06-16-11-16-50-SmNoTamper.jpv 1,071 KB JPV File 6/16/2010 11:16 AM
RoofCam-2010-06-16-11-17-26-SmNoTamper.jpv 1,063 KB JPV File 6/16/2010 11:17 AM
RoofCam-2010-06-16-11-21-03-SmTamper.jpv 884 KB JPV File 6/16/2010 11:21 AM
RoofCam-2010-06-16-11-21-26-SmTamper.jpv 460 KB JPV File 6/16/2010 11:21 AM
RoofCam-2010-06-16-11-21-55-SmTamper.jpv 855 KB JPV File 6/16/2010 11:21 AM
RoofCam-2010-06-16-11-22-22-SmTamper.jpv 854 KB JPV File 6/16/2010 11:22 AM

Figure 48

Note this directory structure is slightly different than that for snapshots. All stored video files are initially stored in one of the subdirectories of the **jpv** folder. "JPV" refers to the file format in which the video is stored. This is a proprietary IVC format that includes the facility for digital watermarking to allow for tamper detection during playback.

Each numbered folder corresponds to a configured camera. Within this folder will be date-stamped folders for each day video was stored for this camera. These folders will contain date- and time-stamped stored video files. In our example folder 6 contains the saved video files for RoofCam. Four days worth of storage are stored in date-stamped subfolders.

NOTE: JPV FILES CAN ONLY BE VIEWED WITH IVC-PROVIDED VIDEO PLAYERS.

To access these files remotely, click on the **View Save Video** link on the Relay Server View Video and Snaps web page (Fig. 45). The Relay Server will list all of the dates on which video was stored for the selected camera (Fig. 49). Click on the date of interest.

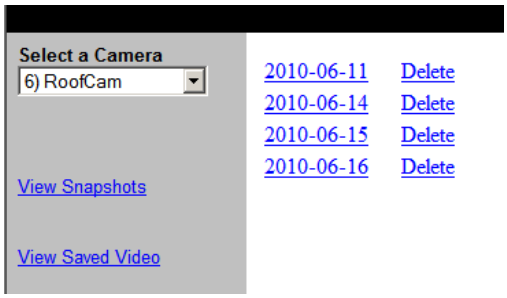


Figure 49

The Relay Server will then display a list of recorded files for that day (Fig. 50).

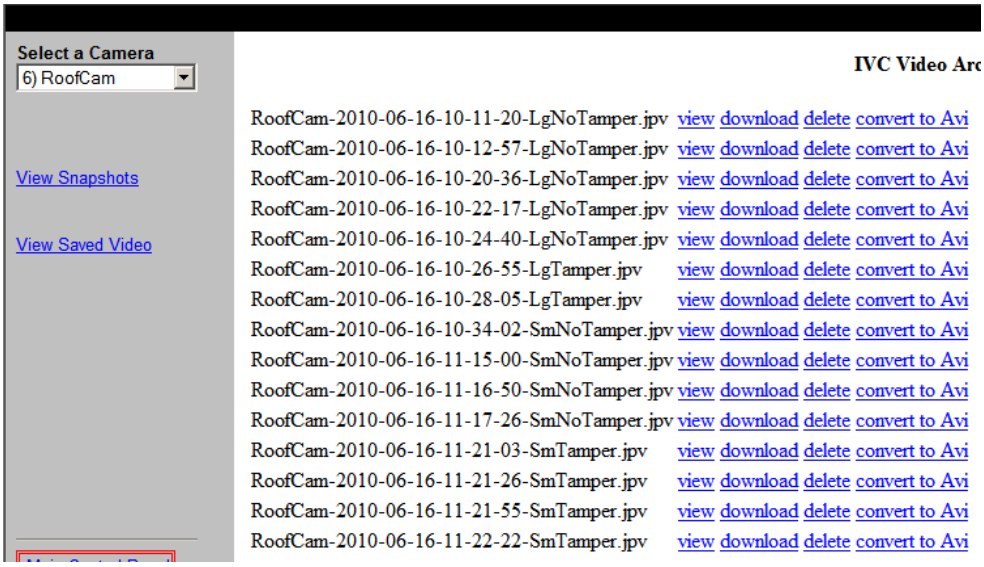
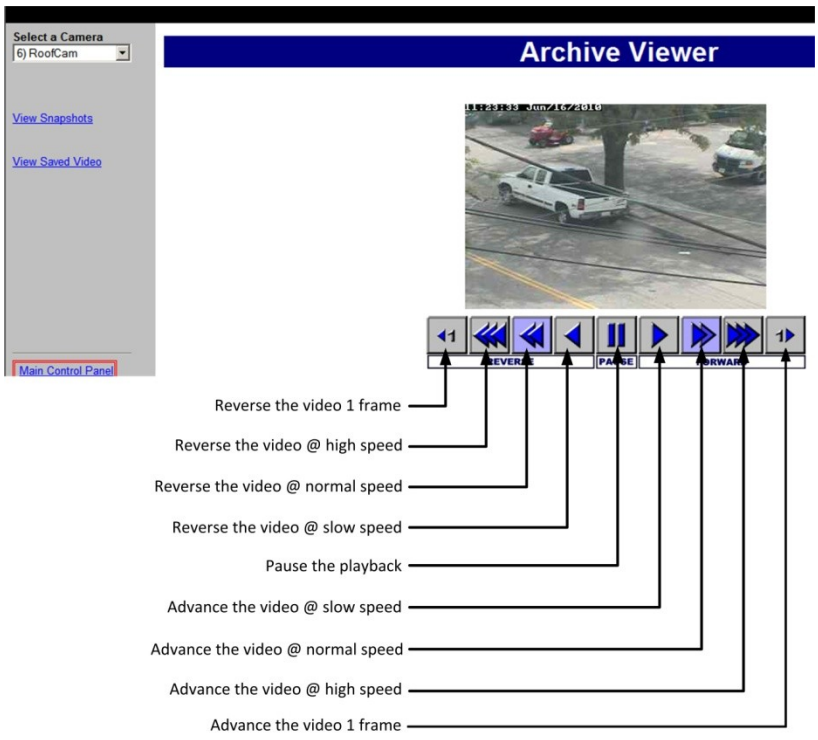

Select a Camera
6) RoofCam
View Snapshots
View Saved Video
IVC Video Arc
RoofCam-2010-06-16-10-11-20-LgNoTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-10-12-57-LgNoTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-10-20-36-LgNoTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-10-22-17-LgNoTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-10-24-40-LgNoTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-10-26-55-LgTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-10-28-05-LgTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-10-34-02-SmNoTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-11-15-00-SmNoTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-11-16-50-SmNoTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-11-17-26-SmNoTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-11-21-03-SmTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-11-21-26-SmTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-11-21-55-SmTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-11-22-22-SmTamper.jpv view download delete convert to Avi

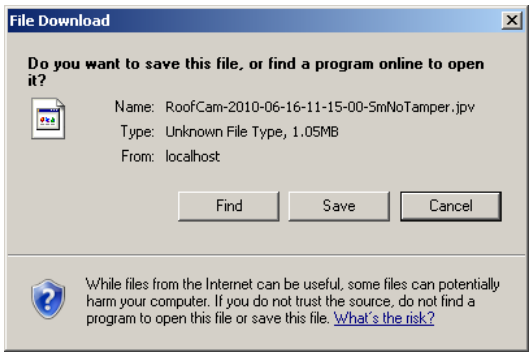
Figure 50

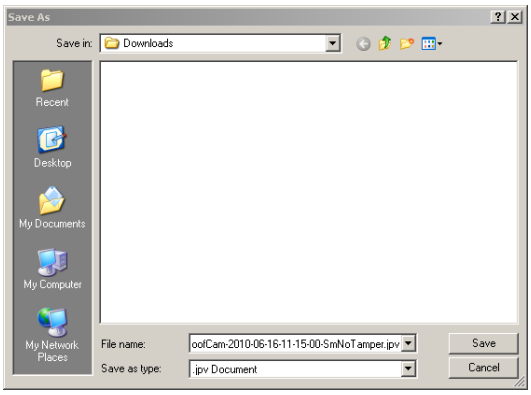
As Fig. 50 illustrates, the named files are listed in chronological order with the camera name, the date, and time the file was recorded. Note if the file was created without a name "**–no name-** "will appear as the file name. Additionally the user is presented with links to provide the following options:

- **VIEW** - Click this link to view the stored video file in the Relay Server's web-based player. The player will immediately start playing back the video at normal speed. Use the controls as indicated below to control the direction and speed of the playback.

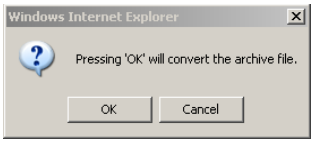

Select a Camera
6) RoofCam
View Snapshots
View Saved Video
Main Control Panel
Archive Viewer
Reverse the video 1 frame
Reverse the video @ high speed
Reverse the video @ normal speed
Reverse the video @ slow speed
Pause the playback
Advance the video @ slow speed
Advance the video @ normal speed
Advance the video @ high speed
Advance the video 1 frame

- **DOWNLOAD** - Click this link to save the stored video file to another location. The following dialog will appear. Click the **Save** button and in the corresponding Windows **Save As** dialog, specify a file name and location for this file.

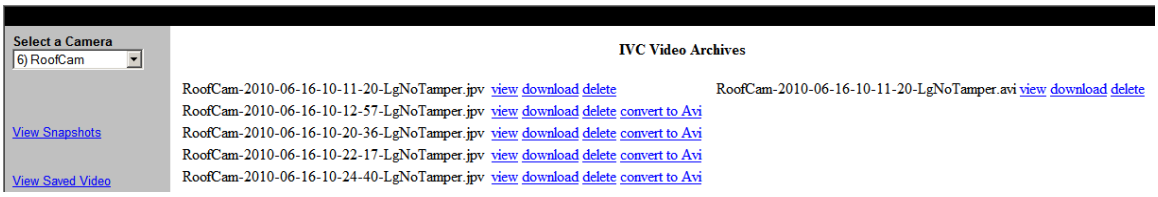

File Download
Do you want to save this file, or find a program online to open it?
Name: RoofCam-2010-06-16-11-15-00-SmNoTamper.jpv
Type: Unknown File Type, 1.05MB
From: localhost
Find
Save
Cancel
While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not find a program to open this file or save this file. What's the risk?



- **DELETE** - Click this link to delete the stored video file. A dialog will appear to give you a chance to confirm or cancel this operation.
- **CONVERT TO AVI** - Click this link to convert the stored .jpv file to an .avi file format. Most Windows compatible players (Windows Media Player, RealPlayer, QuickTime, etc.) support the .avi format. This function is useful for sharing stored video files with users that do have access to IVC .jpv players. The Relay Server Software will present a dialog to give you a chance to confirm or cancel this operation.



Clicking OK will initiate the conversion process for the selected file. Once complete, the Video Archives page will be updated with a links to the newly created file.


Select a Camera
6) RoofCam
View Snapshots
View Saved Video
IVC Video Archives
RoofCam-2010-06-16-10-11-20-LgNoTamper.jpv view download delete
RoofCam-2010-06-16-10-12-57-LgNoTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-10-20-36-LgNoTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-10-22-17-LgNoTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-10-24-40-LgNoTamper.jpv view download delete convert to Avi
RoofCam-2010-06-16-10-11-20-LgNoTamper.avi view download delete

You are now presented with the options to **View, Download, or Delete** this .avi file. These links will function as described above for .jpv files. These .avi files will be stored in the same directory folder as the the .jpv files for the corresponding camera and date.

Verifying Stored Video

If you enabled tamper detection for one or more of you cameras, the stored .jpv files for these cameras contain calculated digital watermarks. This feature enables you to determine these video files have been altered. To perform this verification, you must use the JPVverify utility provided with your Relay Server Software. This utility can be found in your Program Files directory as shown in Fig. 51.

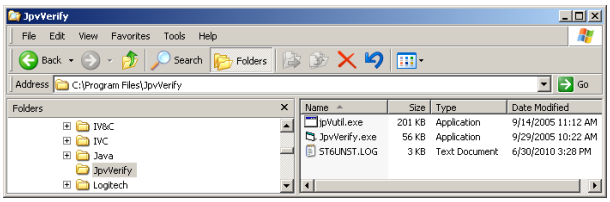


Figure 51

To start the utility, double-click on **JpvVerify.exe**. You will be presented with the user interface shown in Fig. 52.

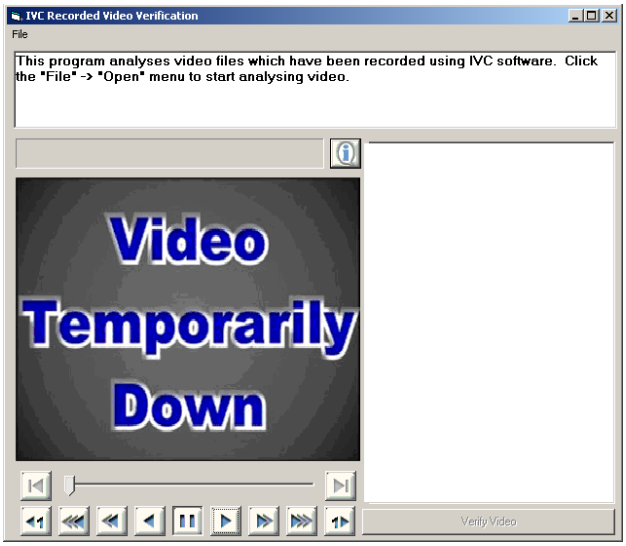

IVC Recorded Video Verification
File
This program analyses video files which have been recorded using IVC software. Click the "File" -> "Open" menu to start analysing video.
Video Temporarily Down
Verify Video

Figure 52

Follow the instructions to load a .jpv file. Click on the **Verify Video** button to verify the file without playing back the video. If the file has not been altered, the verification tool will indicate so as shown in Fig. 53.

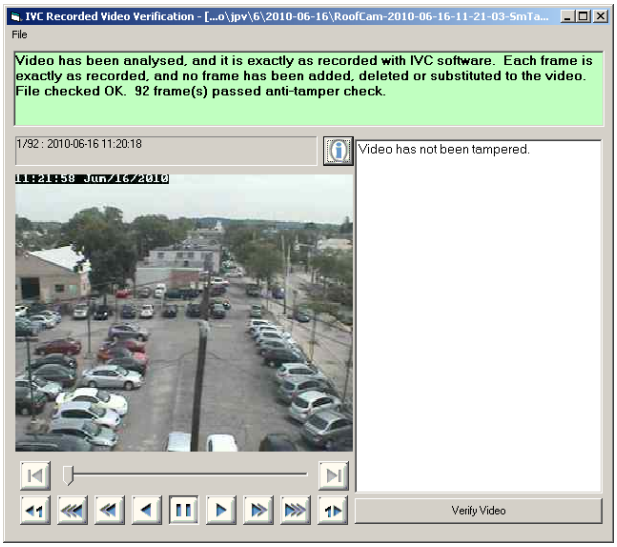

IVC Recorded Video Verification - [...o\jpv\6\2010-06-16\RoofCam-2010-06-16-11-21-03-5mTa...
File
Video has been analysed, and it is exactly as recorded with IVC software. Each frame is exactly as recorded, and no frame has been added, deleted or substituted to the video.
File checked OK. 92 frame(s) passed anti-tamper check.
1/92 : 2010-06-16 11:20:18
Video has not been tampered.
Verify Video

Figure 53

If the video file is not successfully verified, the tool will indicate which frames have been altered (Fig. 54). At this point, you may use the playback features of the tool to possibly determine the

nature of tampering. As each frame is displayed, the JPVverify tool will indicate its verification status.

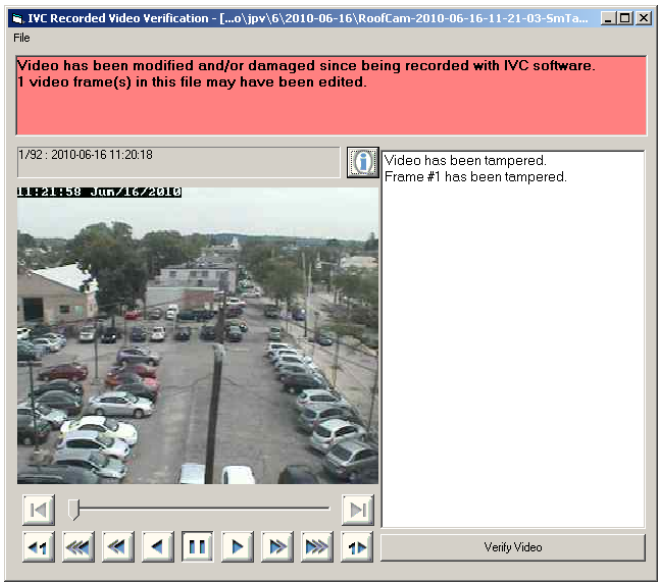

IVC Recorded Video Verification - [...o\jpv\6\2010-06-16\RoofCam-2010-06-16-11-21-03-5mTa...
File
Video has been modified and/or damaged since being recorded with IVC software.
1 video frame(s) in this file may have been edited.
1/92 : 2010-06-16 11:20:18
Video has been tampered.
Frame #1 has been tampered.
Verify Video

Figure 54